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"Program Evaluation of Outcomes Based Orthotic and Prosthetic Education"

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CONTRACTING ORGANIZATION:

**California State University Dominguez Hills Foundation
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14. ABSTRACT <u>Major Accomplishments During Project:</u> Expanded O&P program from 28 to 48 graduates per year. Recruited Kate Muller, CPO, as Lead Orthotics Instructor; writing of new Orthotics curricula and syllabi; installation of new Orthotics Laboratory and teaching of 4 Orthotic and 6 Prosthetic Certificates during the project. Installed "Smart" Classroom, Gait room, and Blackboard (online) Learning System. Development of new Biomechanics, Gait, and Lower Limb Prosthetics curricula. Established student clinical rotation in Navy Medical Center San Diego "C5" Program to work with amputee service members returning from Iraq and Afghanistan (OEF- OIF). <u>Outcome Tools Developed During Project:</u> development of comprehensive list of skills and knowledge required of O&P students in cognitive, psychomotor, and afferent learning categories. Creation of 14 Program Level Objectives designed to be the centerpiece of an outcomes based Program Evaluation Plan; development of checkout criteria for all Orthotic and Prosthetic patient fittings; development of Practical (formative) Exams for each clinical course; transition of all lectures and grading to online Blackboard System; implemented group focus meetings for students to provide critique of ongoing learning; implementation of Graduate and Employer Questionnaires to provide feedback on teaching content. Development of Patient Surveys to provide feedback on student professional behaviors.					
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Program Evaluation of Outcomes Based Orthotic and Prosthetic Education

Award Number: W81XWH-06-1-0144

INTRODUCTION:

There are not enough qualified Prosthetic and Orthotic practitioners to provide services needed by thousands of military amputees, U.S. Veterans, and other Americans living with disabilities. With Department of Defense funding (2005-2008) the university has significantly increased enrollment in both its Prosthetic and Orthotic education programs. The goals of building a new laboratory, expanding an existing laboratory, recruiting new faculty, and purchasing specialized equipment were accomplished in Year 1. The goal to enlarge training capacity from 28 students to 48 students per year, and was achieved in Year 2. Also during Years 2 and 3 the program focused on moving from vocational and knowledge based accreditation standards to competence based standards that are focused on outcomes assessment.

During Year 3 a Program Evaluation was conducted, asking the question “What are the effects of additional resources and increased training capacity on an Orthotic and Prosthetic training program and its clients? The purpose of the Program Evaluation is to assess the effects of increasing practitioner training capacity by 71% on program inputs, activities, outputs, and outcomes. This final report will examine impacts/benefits/changes to students and orthopedic clients as a result of program growth and curriculum changes during and/or after their participation in this 3 year study. Development of new Program Level Outcomes has led to linkage between a variety of new and existing outcome assessment tools, both at the program and course level. Evaluation criteria for each outcome have been developed to provide data based information to make programmatic decisions, and to provide evidence of program quality and effectiveness.

BODY:

Program Evaluation of an Outcomes-Based Orthotic and Prosthetic Education Program

Year 1 Highlights: The investment in remodeling, supplies and equipment in 2006 provided more laboratory space and an increased capacity to train O&P students. The new capacity is 32 students in Prosthetics per year, and a new class capacity of 16 students in Orthotics per year. Total capacity planned in the project was 48 graduates per year, and this objective was met during Year 1. Kate Muller, CPO, was recruited to become the Lead Orthotic Instructor. A new, 1000 square foot teaching laboratory and 900 square foot “Smart” Classroom were developed in existing space. A remodel of the Gait room, two additional offices, and installation of a wheelchair lift and addition of a cafeteria privacy curtain were also completed.

Year 2 Highlights: Mark Muller CPO, who teaches both Prosthetics and Orthotics, and most Biomechanics and Gait courses, joined the faculty. The expanded O&P project also recruited a new part time instructor, Britt-Guerre Aguilar, CPO, who is an ABC certified Prosthetist - Orthotist with 13 years of patient care experience. Glenn Ham-Rosebrock, CO, with over 38 years patient care experience was re-appointed as a part time instructor. Kate Muller, CPO continues in the position of Lead Orthotic Instructor. After obtaining feedback during the first and second Orthotic Certificates (Jan-June, 2006 & 2007), she has revised the Orthotics curricula, including Upper Extremity Orthotics, Spinal Orthotics, Lower Extremity Orthotics, Biomechanics, and Research. During Year 2 the school produced 48 graduates for the first time, achieving the training capacity goal.

Year 3 highlights: The O&P Program conducted two Orthotic and two Prosthetic Certificate classes in 2008, resulting in a record 62 graduates in one year. Although the Orthotic faculty was overworked during this year, the additional enrollment allowed the school to enroll fewer students in Spring-Summer 2009, a period when we will move the program 30 miles to a new location at the Long Beach VA Medical Center. During 2008 the CSUDH O&P Program secured a lease agreement with the Long Beach VA Medical Center to move the education program into a new state of the art teaching center with over 9000 square feet. The estimated contribution by the VA is \$2.2 Million for the build-out, and additional free rental space to CSUDH. With the program's new capacity, new faculty, new program evaluation plan, and new space, CSUDH is becoming the West Coast leader in Prosthetic and Orthotic Education.

The Program worked closely with Dr. Mary Cruise, from the Student Learning Outcomes Assessment group (SLOAC) at California State University Dominguez Hills. She is an assessment expert and consultant to the O&P Program. She has examined all of new and revised assessment tools, such as tests, quizzes, surveys, practical exams, research papers, focus groups, rubrics, etc., to analyze how we measure various evaluation questions, indicators of their achievement, methods of measurement, results, and areas still in need of improvement.

We have worked with Dr. Cruise to identify evaluation criteria utilizing the American Board for Certification "Domains of the Practice Analysis". The ABC Domains are: Patient Assessment, Formulation of the Treatment Plan, Implementation of the Treatment Plan, Follow-up Treatment Plan, Practice Management, and Promotion of Competency and Enhancement of Professional Practice.

In consultation with Dr. Cruise, a Program Evaluation Plan was drafted. (APPENDIX II.) The draft assessment matrix for the report consists of the following elements: Unit of Evaluation, Criteria/Indicators (of evaluation unit), Methods, Results, and Conclusions/Actions.

Dr. Cruise and Mr. Hornbeak have formalized the Program Evaluation Plan as part of the final deliverable product for this project.

The CSUDH O&P Program contacted Mr. Peter Harsch, CP and Commander Kathy Goldberg, RPT at the Naval Medical Center San Diego (NMCSD) Division of Comprehensive Combat & Casualty Care (C5) Program, in order to offer support of the returning amputee veterans from Iraq and Afghanistan. Our program hosted visits by Mr. Harsch (Balboa Naval Hospital – Chief Prosthetist) with 21 of the wounded veterans to our site in July 2007 and again in 2008. Several of the wounded soldiers have an interest in pursuing O&P as a career, and received counseling on how to enter this field. Subsequently C5 Commanders at the Naval Medical Center San Diego negotiated with the O&P Program to secure a formal Affiliation Agreement. With that agreement we started clinical rotations of prosthetic students into the NMCSD during Fall 2008. Starting in Fall 2008, 16 student and 3 faculty made weekly visits to C5 amputee center (approximately 70 miles from our location). Also see article in O&P Business News, "Joining Forces", Nov. 1, 2008. (APPENDIX V.)

In Process Review, March 13, 2008:

Mr. Troy Turner and Ms. Ashley Glenn visited the CSUDH O&P Program on March 13, 2008 in order to consult with the faculty who are directing this project. An In Process Review took place to describe the project in detail, and to develop a timeline for the expected deliverables. Mr. Scott Hornbeak and Ms. Kate Muller presented the project accomplishments. Dean Mitch Maki, PhD, and Mary Cruise, DNSc., (Assessment consultant) also attended.

A detailed summary of the accomplishments associated with each task in Statement of Work follows:

TABLE 1. ACCOMPLISHMENT OF OBJECTIVES IN STATEMENT OF WORK

Objectives/Tasks	Timeline	11/15/05 – 11/14/08
Task 1. To increase the training capacity of a university Based Orthotics and Prosthetics practitioner training program from 28 students to 48 students per year.	Month 1-36	41 graduates in O&P in Year 1. Capacity of 48 reached in Year 2. 62 graduates in Year 3.
1.a. Recruit and hire lead Orthotics instructor.	Months 1-3	Kate Muller, CPO, actively teaches/leads Orthotics Certificate
1.b. rewrite existing orthotics curriculum to meet outcomes based evaluation standards mandated by National Commission on Orthotics and Prosthetics Education (NCOPE)	Months 1-3	Orthotics curriculum updated and taught 4 times. Achieved full NCOPE accreditation through 2009.
1.c. Design and install new Orthotics teaching laboratory.	Month 1-6	Completed Feb. 2006
1.d. Purchase equipment for Orthotics teaching laboratory.	Month 1- 6	Completed Feb. 2006
1.e. Recruit and select first Orthotics certificate class.	Months 1-6	Completed Jan. 2006
1.f. Purchase expendable supplies for orthotics and prosthetics expansion.	Months 1-36	100% of expendable supplies have been purchased.
1.g. Add 4 prosthetic students per year.	Months 1- 36	12 students added by 2008
1.h. Teach 32 prosthetic certificate students per year; and 16 orthotic certificate students per year.	Months 13-36	Program met capacity of 32 Prosthetic And 16 Orthotic students in Jan. 2007
Task 2. To perform program evaluation on the effects of increasing program capacity from 28 graduates to 48 graduates per year.	Months 1-36	Program has expanded from 28 graduates to 48 graduates. Program Evaluation Plan is in place.
2.a. Assess changes in <u>program inputs</u> ; faculty, staff, facilities, equipment, expendable supplies, and budget.	Months 1-36	Kate Muller, CPO, and Mark Muller, CPO, hired. 2 part time faculty hired (Ham-Rosebrock and Guerre-Aguilar). Hornbeak and Ramirez contribute 20% time each to Orthotics Program. \$128,669 for major equipment, \$47,000 supplies, \$22,770 consultants has been expended.
2.b Assess changes in <u>activities and processes</u> ; teaching methods, patient models, curriculum changes, student-teacher ratios, advising, and placement. (Months 7-36)	Months 7-36	Practice Management, Anatomy, Materials Science, Gait, Biomechanics and Research have doubled in capacity. Student-teacher ratio increased to 32:1. Orthotic patient models now utilized in all Ox courses. All syllabi and lectures available via Blackboard Learning System. Student-teacher ratios have increased to 16:2.5 in all (P) and (O) lab courses. Placement into Residency is 99%.
2.c. Assess changes in <u>program outputs</u> ; number of people taught, number of graduates, and estimates of orthopedic clients affected.	Months 13-36	Expanded from 28 graduates in 2005 to 48 graduates in 2007. (71% increase). Clients affected: At 8.5 clients seen per day, each new graduate will see 2125 clients per year. Managers will effectively see (3X) or 6375 per year. Practitioner/Mgr. ratio=3:1. Therefore class of 48 treats (at 36:12 ratio) = 153,000 clients seen per year.

Objectives/Tasks	Timeline	11/15/05 – 11/14/08
2.d. Assess student outcomes: 1. Knowledge (cognitive) and Skills (psychomotor) 2. Behavior (afferent). 3. Values	Months 7-36 Months 13-36 Months 23-36	Existing cognitive and psychomotor exams and rubrics in place; new Practical exams in each clinical course written. New Oral Presentation Rubric, Graduate Questionnaire Employer Questionnaire, and Patient Survey have been written to assess these outcomes. Psychosocial, professional, and ethical behaviors have been incorporated.
2.e Assess <u>outcome targets and indicators</u> ; percent who graduate, percent who achieve “B” or above in cognitive and psychomotor domains; percent who achieve 80% or above in professional behavior, percent who achieve 80% or above on demonstrated core values, percent placed in Residency, and percent who pass ABC certification.	Months 24-36	99% of accepted students in O or P Certificates graduated. All scored at “B” or better in cognitive and psychomotor domains. Students scoring above 80% on Professional behavior as measured in Critiques and Patient Surveys. 100% of graduates placed in Residency or returning to school for other discipline. 71% have passed ABC Certification in combined Winter ‘06 and June ‘07 exams.
Task 3. To write, review, and present Program Evaluation to stakeholders. (Months 24-36)	Months 24-36	Final report including Program Evaluation completed and submitted to TATRC.

The Statement of Work (Summary in TABLE I) breaks down this project into two major tasks: Task 1, Increasing training capacity and Task 2, Performing Program Evaluation. The following highlights specific progress relative to the project objectives associated with these tasks:

Task 1: To increase training capacity of an Orthotics and Prosthetics education program from 28 graduates to 48 graduates per year. Specific project objectives and their status at the close of the project are denoted in **Bold**.

1. To increase the training capacity of a university based Orthotics and Prosthetics practitioner training program from 28 students to 48 students per year. **Done; end of Year 1.**
2. To increase the number of qualified practitioners available to serve the nation's disabled population, with specific focus on service to military amputees and orthopedically disabled. **Done, all 3 years of project. (151 graduates)**
3. To rewrite, develop, and implement a new Orthotics curriculum. **Done; end of Year 1.**
4. To increase the capacity of the existing Prosthetics training program. **Done; Year 1.**
5. To conduct an outcomes-based Program Evaluation of the effects of program growth from 28 students to 48 students per year. **Started in Year 1; continues thru Year 3.**

Task 2: To perform program evaluation on the effects of increasing program capacity from 28 graduates to 48 graduates per year. Specific project objectives and their status at the close of the project are denoted in **Bold**.

6. To assess changes in program inputs; faculty, staff, facilities, equipment, expendable supplies, and budget. **Done; 2 new full time and 2 new part time faculty hired. New Orthotics Lab completed, Prosthetic Lab expanded, New equipment purchased, supplies and consumables purchased.**

7. To assess changes in activities and processes; teaching methods, patient models, curriculum changes, student-teacher ratios, advising, and placement. **Done; ongoing. Development of 14 new Program Level Outcomes led to linkage between new and existing outcome assessment tools. Student to teacher ratio in didactic classes is now 32:1. Student to teacher ratio in laboratory is now 16:2.5. All syllabi, announcements, grading, Power Point lectures, and videos are now online. Distance learning modules from AAOP (Academy Learning Center) are now online. Course objectives are currently being revised to insure student achievement of 14 new program-level outcomes.**

8. To assess changes in program outputs; number of people taught, number of graduates, and estimates of orthopedic clients affected. **Done; ongoing. Expanded from 28 graduates in 2005 to 48 graduates in 2007, a 71% increase. (151 total graduates during 3 year project). Clients affected: At 8.5 clients seen per day, each new graduate will see 2125 clients per year. Managers will effectively see (3X) or 6375 per year. Practitioner/Mgr. ratio=3:1. Therefore class of 48 treats (at 36:12 ratio) = 153,000 clients seen per year.**

9. To record and evaluate student outcomes:

- a. Knowledge (cognitive abilities) and Skills (psychomotor abilities)
- b. Professional Behavior (afferent abilities)
- c. Values

Done; ongoing. Drafted “What We Assess Matrix” in Year 1 (APPENDIX X.) to indentify Cognitive, Psychomotor, and Afferent learning across American Board for Certificate “Domains of Practice”. Found that program assessed very little afferent (professional) behavior with existing assessment tools. In Year 2 – 3 drafted a new set of 14 Program Level Outcomes to reflect desired student learning outcomes and developed new “Program Evaluation Plan” (APPENDIX II.). Ongoing data collection with new assessment tools: new Practical exams in each clinical course written. New Oral Presentation Rubric, Graduate Questionnaire, Employer Questionnaire, and Patient Survey have been written to assess student outcomes.

10. To evaluate achievement of target behaviors, including indicators of graduation rates, mastery of cognitive, psychomotor domains, and afferent domains; mastery of professional behavior and core values as measured by case studies of patient care, observation assessment tools, written papers, graduate surveys, Residency placement rate, and percent who pass ABC certification. **Done; ongoing. 99% of accepted students in O or P Certificates graduated. All scored at “B” or better in cognitive and psychomotor domains. Students scoring above 80% on Professional behavior as measured in Critiques and Patient Surveys. 100% of graduates placed in Residency or returning to school for other discipline. 71% have passed ABC Certification in combined Winter ‘06 and June ‘07 exams.**

11. To write, review, and disseminate Program Evaluation to stakeholders. **Final Report Done; Presentations/reports to AAOP and NCOPE planned.**

Additional Accomplishments:

1. In 2007 a new Plaster Room was planned, built, and 48 students utilized it to make both Orthotic and Prosthetic Programs more efficient.
2. Since October 2006, both the Orthotic and Prosthetic Certificate programs have held full accreditation status from the Commission on Accreditation of Allied Healthcare Educational Programs (CAAHEP). This nationally recognized CAAHEP accreditation is a powerful form of external validation of program quality, which is only achieved through diligent program assessment and a commitment to continuous improvement.
3. CSUDH is the only O&P training program in the country to have a clinical rotation in a Comprehensive Combat & Casualty Care Program. Mr. Peter Harsch, CP and Commander Kathy Goldberg, RPT at the Naval Medical Center San Diego have collaborated with the O&P Program to secure a formal Affiliation Agreement. The Affiliation Agreement has been completed, and starting in Fall 2008, 16 student and 3 faculty made weekly visits to C5 amputee center (approximately 70 miles from our location). This clinical rotation will continue starting in January 2009.
4. Upon learning that the lease was expiring at the current location Ossur North America in Orange County, CA, the program secured new space, rent free, at a customized 9000 square feet facility at the Long Beach VA Medical Center in Long Beach, CA. We look forward to the medical affiliation with VA doctors, nurses, therapists, and rehabilitation specialists, as well as interaction with VA patients.

Introduction to Evaluation Plan

The original study design for the project is as follows: A Program Evaluation will assess the effects on program inputs, activities, outputs, and outcomes of increasing practitioner training capacity by 71%. The evaluation will examine impacts/benefits/changes to students and orthopedic clients as a result of program growth and curriculum changes during and/or after their participation in this 3 year study. A new Orthotics curriculum will be implemented. Outcomes evaluation will examine these changes in the short-term, intermediate term and long-term. As this expansion occurs, the program will move from knowledge based accreditation standards to competence based standards that are focused on outcomes assessment.

Task 1 of the study was accomplished without major complications. Certainly the program has expanded its capacity to teach O&P students, which has led to greater services available to amputee and orthopedic clients across the U.S. Task 2, the program assessment piece, proved to be much more challenging. We have developed and implemented new Program Level Outcomes that led to review and in some instances, revision of Course Level Objectives. We have identified new and existing assessment tools that measure the student learning outcomes at both the program level and at the course level. By following the new "Program Evaluation Plan" we have written new course syllabi and objectives, and implemented the new program and course assessments in individual courses. We have also rewritten Oral Communication rubrics, Professionalism standards within the clinical critiques, and new Graduate, Employer, and Patient Surveys.

A Program Evaluation Plan has developed over the years of the grant award to identify the impact (effects) of Department of Defense (DOD) support on the Orthotic and Prosthetic program inputs, activities and processes, and outputs. This section addresses the outputs relative to student learning outcomes assessment.

Assessment of student outcomes began early in the grant award years with a focus on “what” will be assessed; that is, cognitive, psychomotor and affective (professional behavior and values) domains, of knowledge and skills. Detailed matrices of the activities associated with these domains were developed which guided the construction of new course syllabi and revision of existing syllabi in that course-level objectives (CLOs) and the assessment methods to show achievement, were stated. Consistent, ongoing assessment data collection and analysis provide formative (course by course) information about student learning and quality.

As attention turned toward Program assessment, it was determined that program-level outcomes (PLOs) and assessment methods were needed in order to provide evidence of student learning and quality, summative information, at the conclusion of the program. The 14 PLO’s are presented here in their entirety and in abbreviated form in Column 1 of Appendix II.

Development of Program-Level Outcomes

The first six (6) of the 14 Program Level-Outcomes are extracted from the Domains of Practice identified in the “Practice Analysis of Certified Practitioners in the Disciplines of Orthotics and Prosthetics”, American Board for Certification (ABC) in Orthotics, Prosthetics and Pedorthics, Inc. (2007). The remaining Program-Level Outcomes are derived from the Pugh Commission Report (2006), the Standards and Guidelines for the Accreditation of Educational Programs in Orthotics and Prosthetics (2006) upon recommendation of the National Commission on Orthotic and Prosthetic Education (NCOPE). The CSUDH O&P Program-Level Outcomes are consistent, compatible, and congruent with ABC Domains while emphasizing specific outcomes deemed significant to show evidence of achievement through program-level assessment methods.

Program-Level Outcomes are student centered as stated; that is, “At the conclusion of the O&P program”...”the student will demonstrate ability to:...”. Program-Level Outcomes are measurable by using rubrics designed to elicit evidence of achievement in specific assignments designated as Program-Level Assessment(s). Program-Level Outcomes and Program-Level Assessment(s) overarch Course-Level Objectives and Course-Level Assessment(s).

At the conclusion of the Orthotic and/or Prosthetic Programs at CSUDH, the student will demonstrate ability to:

1. Perform a comprehensive assessment of the patient to obtain an understanding of the patient’s orthotic/prosthetic needs.(ABC Domain)
2. Formulate a comprehensive orthotic/prosthetic treatment plan by analyzing and integrating information from patient assessment to meet the needs and goals of the patient. (ABC Domain)
3. Implement the prescribed orthotic/prosthetic treatment plan by performing the necessary procedures to deliver the appropriate orthotic/prosthetic services, including fabrication. (ABC Domain)
4. Follow up the treatment plan by providing continuing patient care and periodic evaluation to assure/maintain/document optimal fit and function of the orthosis/prosthesis. (ABC Domain)
5. Practice management effectively by developing, implementing and/or monitoring policies and procedures regarding human resources, the physical environment, business and financial practices, and organizational management. (ABC Domain)

6. Promote competency and enhance professional practice by participating in personal and professional development through continuing education, training, evidence-based research, and organizational affiliations. (ABC Domain)
7. Use laboratory equipment and supplies correctly, safely and efficiently on behalf of O&P patients to maintain a safe and secure laboratory and clinical environment. (NCOPE; ABC Domain Tasks outlined in 2, 3, and 4)
8. Ensure structural safety, comfort, fit and patient understanding about the use and maintenance of the orthosis/prosthesis. (NCOPE; ABC Domain Tasks outlined in 1, 2, 3 and 4)
9. Utilize Universal Precautions and Personal Protective equipment in compliance with OSHA's Hazard Communication and Bloodborne Pathogen rulings. (ABC Domain Tasks outlined in 3, and 4; Pugh Commission)
10. Practice relationship-centered, culturally sensitive care with individuals and families during all phases of O&P interaction (assessment, treatment planning, implementation and follow up). (Pugh Commission)
11. Exhibit psychosocial awareness of patients' age, educational status, economic status, social support, etc. (Pugh Commission; ABC Domain Tasks outlined in 1, 2, 3 and 4)
12. Work in interdisciplinary teams during interaction with patients, peers, colleagues, supervisors, and other health team members. (Pugh Commission)
13. Exhibit ethical behavior in all professional activities during interaction with patients, peers and colleagues, teachers and supervisors, and health team members/affiliates. (Pugh Commission; NCOPE)
14. Provide evidence-based, clinically competent care by applying knowledge from theory, research, new sciences and foundation courses such as kinesiology, anatomy, biomechanics, gait, and material science to the practice of orthotics/prosthetics. (NCOPE; Pugh Commission)

The Program Evaluation Plan

The assessment piece of the Program Evaluation Plan needed to expand from the “what” to the “how” and beyond. Therefore a Program Evaluation Plan matrix was constructed that includes the following columns: Unit of Evaluation, Criteria/Indicators, Methods, Results, and Conclusions/Actions. Each column is described in turn as it relates to program-level student learning outcomes, assessment, and program quality. (APPENDIX II.)

Unit of Evaluation refers to the identified, program-level student learning objectives (PLO's) (14) that are extracted from the American Board for Certification (ABC) in Orthotics Prosthetics and Pedorthics (2007), the National Commission on Orthotic and Prosthetic Education (NCOPE, 2006), and the Pugh Commission Report (2006).

Criteria/Indicators refer to the PLO's stated in student-centered, measurable, and achievable terms demonstrated at the conclusion of the program.

Methods refer to direct and indirect program-level assessment measures (tools) used to elicit data to provide evidence of achievement of PLO's (student learning) and program quality.

Results refer to assessment data outcomes due to use of stated direct and indirect assessment methods. Additionally, results address utility, adequacy, etc. of methods to provide evidence of PLO achievement.

Conclusion/Actions refer to assessment methods and changes in construction or need to develop and/or implement to provide evidence of PLO achievement.

The Program Evaluation Plan serves to highlight, clarify, specify, supplement and/or augment program-level assessment activities. It needs to be extended to portray ongoing evaluation; for example, include headings such as Who takes Action, When is Action Scheduled, Results of Action, and so on. Additionally, it serves as a guide for ongoing program-level assessment, and perhaps, impetus for further study (see Appendix II), Program Evaluation Plan.

Student Outcomes Assessment

Assessment is an ongoing and multifaceted process based on inquiry and exploration as well as measurement to determine how well and in what ways stated objectives/outcomes are achieved (derived from the CSUDH policy on Academic Assessment, PM 00-04). Specifically, student outcomes identify the knowledge, skills and dispositions (values, attitudes, etc.) the student must demonstrate at the conclusion of the program. In the O&P program, knowledge, skills and dispositions correspond with the cognitive, psychomotor and affective domain framework used to identify course-level and program-level outcomes.

Student outcomes assessment is concerned with the methods/tools used to elicit data regarding outcomes achievement. In DH terms, outcomes achievement equals learning. Therefore, there should be (1) a high degree of correspondence between what is being measured or investigated by an assessment instrument or tool and the stated student outcomes, (2) evidence that program-level assessment method(s) are designed to measure/explore program-level outcomes, and (3) results of program-level assessment that provide evidence of student learning as identified in the program-level outcomes (Essential Elements of Learning Outcomes Assessment, Indicators 4 & 5, University Student Learning Outcomes Assessment Committee{USLOAC 3/18/04}).

In this report, outcomes assessment methods are considered direct or indirect. Direct assessment methods are defined as those that provide demonstrated evidence of outcome achievement (oral, written, clinical performance, etc.). Indirect assessment methods are defined as those that provide an individual or group's perception of outcome achievement (surveys, focus group, self evaluation, etc.).

Although the Program Evaluation Plan is, for the most part, quantitative in reporting results that show impact on the program because of DOD support, the assessment piece is descriptive at this time (descriptive data and sampling) and serves as preliminary baseline for ongoing and consistent student outcomes assessment activity. It is important to note the following when reviewing the assessment report and the Program Evaluation Plan regarding student outcomes assessment:

- data collection and analysis were conducted by one evaluator on 2007 and 2008 samplings of student materials representing both direct and indirect assessment methods such as papers, logs, critiques, evaluations, satisfaction surveys, etc.;

- all syllabi were reviewed for inclusion of student-centered, measurable course-level objectives and their assessments;
- all materials were reviewed for inclusion of psychosocial, affective, ethical, and professional behaviors;
- program-level outcomes were identified; program-level assessment methods were designated as distinct from course-level;
- all course-level assessment methods are not presented in this report, but are non-the-less important to course level objective achievement. These are Oral Presentation Assessment, Practical Examinations, and Focus Group discussions to name a few;
- review of assessment methods, course-level and program-level, generated revision, creation, and/or deletion of irrelevant assessment methods during the course of the project;
- PLO's 1 through 4 are basic to the professional Orthotic and/or Prosthetic practitioner. Supervision, formative assessments, exams, projects, and critique and feedback are integral at the course-level and summative assessments are essential at the program-level. Therefore, both course-level and program-level assessment methods are presented; and finally,
- each program-level outcome does not require a separate, distinct assessment method; each assessment method may address one or more program-level outcomes.

The evaluation of student outcomes assessment is varied and inconclusive at this time. However, much has been done to bring structure and consistency to the process and to insure that assessment methods are designed to elicit the information needed to show evidence of learning and quality at the program level. Professional, psychosocial, ethical and affective behavior have been added to program-level assessment methods; that is, Clinical Case Studies, Clinical Logs, Clinical Preceptor Evaluation (direct) and Patient Survey, O/P Graduate Questionnaire, and Employer Questionnaire (indirect), and to course-level assessment methods (Critiques, Initial Patient Interview, and Project assignments).

Analysis of data relative to program-level assessment methods reveal evidence is present of achievement of PLO's 1 through 4. In the case of evidence relative to PLO achievement 5 through 14, there is little to no evidence present in the 2007 and 2008 sampling data analyzed. As a consequence, action as described below was instituted. The new and revised assessment methods are scheduled for data collection and analysis in 2009. It is intended that these results constitute the baseline data needed to show progress, improvement and/or inadequacy relative to learning and program quality.

Also, analysis of program-level assessment methods' materials revealed that several assessment methods were not eliciting data relative to PLO achievement (learning). (Clinical Case Study reports, Clinical Logs, Clinical Preceptor Evaluation, Patient Survey, Graduate Questionnaire, Research Project and Online Learning Modules) and so are revised to do so. In the case of Graduate Survey, the revision was renamed to Orthotic or Prosthetic Graduate Questionnaire. Focus group and Exit Survey methods were deleted and an Employer Questionnaire was created.

Full and consistent implementation of the assessment process as identified in the Program Evaluation Plan has been delayed; however it is on track to successfully assess student outcomes as defined by the program faculty in 2009. In conclusion, one impact of the DOD grant award has focused the program on assessment and evaluation to the benefit of patients, students and faculty.

NEXT STEPS:

- Complete all revisions to syllabi and PLO assessment materials in preparation for data collection beginning in January, 2009

- Establish a data collection and analysis Chart to guide tracking of PLO assessment
- Identify a Data Manager/Research Assistant whose responsibility includes oversight and monitoring the process as outlined in the data collection chart, preparing materials for data analysis, and reporting organization and fit with the Evaluation Plan
- Formalize a data base derived from conclusions drawn from collection, analysis, and interpretation of PLO assessment methods results by the end of 2009

PROPOSED STUDIES:

- An Evaluation Study that asks the question, “How effective is the O&P Program in terms of student outcomes learning and program quality?”
- Correlation studies, “To what extent do the direct and indirect PLO assessment methods show evidence of a positive relationship ($p=.05$)?” Clinical Preceptor Evaluation (direct) and (1) O/P Graduate Questionnaire (indirect); (2) Patient Survey (indirect); and (3) Employer Questionnaire (indirect).

In conclusion, by the end of 2009, the O & P Program, based on Evaluation Plan outcomes, will be positioned for formal assessment research, accreditation renewal and grant submissions.

KEY RESEARCH ACCOMPLISHMENTS:

- New Orthotics Laboratory, O&P classroom, and Gait room completed; Prosthetics Lab expanded.
- New faculty recruited to teach Orthotics and Prosthetic Programs; Kate Muller, CPO, Mark Muller, CPO, Glenn Ham-Rosebrock, CO, and Britt Guerre-Aguilar, CPO.
- Program has expanded from 28 graduates to 48 graduates.
- New Orthotics curriculum developed and taught 4 times.
- Revised Prosthetics curriculum developed and taught 6 times.
- Implementation of online Blackboard Learning System, Academy Online Learning Modules, and wireless access throughout the teaching facility.
- Created 14 Program Level Outcomes to provide foundation for gathering evidence of student learning.
- Creation and implementation of new Program Evaluation Plan.
- Collaborated with Navy Medical Center San Diego to create clinical rotation of Prosthetic students with returning veterans with amputations and/or traumatic injuries.
- Revised all course syllabi to reflect new student learning objectives derived from Program Level Outcomes.
- All Midterm and Final Examinations in (O) and (P) rewritten (Cognitive assessment).
- Development of Clinical “Check-out” Sheets for all major clinical projects in Orthotics and Prosthetics (Cognitive and Psychomotor assessment).
- Development of new Oral Presentation Rubric for patient presentation (Afferent assessment)
- New Practical Exams instituted at close of each clinical (O) and (P) clinical course.
- Student Questionnaire on effectiveness of training content developed in both O&P.
- Employer Questionnaire that addresses the 14 revised Program Level Outcomes developed.
- Patient Survey developed for patient models to assess professional behavior of students.
- Assessment Matrix developed to reference Domains and required skills and knowledge required of an Orthotic or Prosthetic Practitioner across Cognitive, Psychomotor, and Afferent categories. (Precursor to Program Evaluation Plan)

REPORTABLE OUTCOMES:

The Orthotics and Prosthetics Program at California State University Dominguez Hills has carried out this project (2005-2008) under the Outcomes and Program Assessment (OPA Program) in the Advanced Prosthetics and Human Performance Portfolio that is part of the Army's Telemedicine & Advanced Technology Research Center (TATRC). Specifically, the purpose of this project is to assess the changes in program inputs, activities and processes, and outputs when an Orthotic and Prosthetic Practitioner training program grows from 28 to 48 graduates per year.

Also, this project serves to study student learning outcomes in the field of Orthotics and Prosthetics that directly affect the quality of care provided to returning veterans and others with traumatic injuries or amputation. Most of Year 1 activities focused on expanding the program. But a key aspect of this program evaluation is the development of assessment tools that report student outcomes in Cognitive, Psychomotor, and Afferent (behavioral) domains. California State University Dominguez Hills will share these tools with other Orthotic and Prosthetic Education Programs via presentations at conferences and in written reports. We anticipate presenting the assessment tools to the other O&P educational institutions after the outcome tools are fully implemented and improved during and after Year 3 of the project.

The following are reportable outcomes that have resulted from this project:

Appendix I: GANNT Chart – Accomplishment of Objectives.

Appendix II: Program Evaluation Plan

Appendix III: Pictures of New Orthotics Laboratory, New Gait Room, Expanded Prosthetics Laboratory and 151 graduates 2005 – 2008. Pictures of Wounded Warriors visit to O&P Program in July 2007.

Appendix IV: Article “Joining Forces”, O&P Business News, November 1, 2008

Appendix V: Samples of new syllabi. Biomechanics Syllabus and new Directed Research Syllabus

Appendix VI: Sample of Oral Presentation Rubric for presentation to patients and peers. Sample of Clinical Check-out for Trans-tibial Fabrication and Critique.

Appendix VII: Sample of new O&P Student Questionnaire given during year after graduation.

Appendix VIII: Sample of new Employer Questionnaire to be mailed at completion of (1 year) Residency.

Appendix IX: Sample of new Patient Survey to assess student professionalism

Appendix X: “What We Assess” Matrix sorted by Cognitive, Psychomotor, and Afferent Domains.

Appendix XI: Evidence of Accreditation; CAAHEP Accreditation of Orthotic and Prosthetic Certificate Education Programs.

CONCLUSION:

There are not enough qualified Prosthetic and Orthotic practitioners to provide services needed by thousands of military amputees, U.S. Veterans, and other Americans living with disabilities. With Department of Defense funding (2005-2008) the California State University Dominguez Hills has dramatically increased enrollment in its Prosthetic and Orthotic programs. While only nine institutions nationwide currently offer O&P education, the demand for provider services is expected to increase by 25% for orthotic care and 47% for prosthetic care by 2020 (Nielson, 2000). Currently, there is an average of 250 graduates per year in all O&P practitioner programs in the United States. This project has added 20 graduates per year to this pool, therefore expanding practitioner output by a full 8%. Therefore, the Department of Defense and the Veterans Administration directly benefit from greater numbers of qualified prosthetic and orthotic practitioners who work at regional Army, Navy, and Veterans Administration practices or in private practices that serve veterans.

During this project, several Outcome Assessment Tools were either developed or revised to assess the students' learning in the cognitive, psychomotor, and behavioral domains. The tools developed include Written Examinations, Practical Examinations, Check-out sheets, Graduate and Employer Questionnaires, Patient Surveys, and Oral Presentation Assessments. These tools are available to be shared with other Orthotic and Prosthetic Education programs nationwide.

During the project CSUDH O&P Program also implemented the use of its university Blackboard software, which is an internet access software program where students may view syllabi, course lecture notes, Power Point presentations, drawings, and the like. With Blackboard access, we have been able to assign Power Point lectures and films ahead of time, so that a student is fully prepared for live lecture when they arrive in class. Also, the provision of quizzes, term tests, and grading has been improved by the use of Blackboard. CSUDH has begun to assign online Academy produced Learning Modules to augment student learning during each clinical course.

14 new Program Level Outcomes were written that provide the foundation for program level achievement of student learning. By expanding the PLO's to include areas such as relationship centered care, cultural sensitivity, psychosocial awareness, and ethics, the program has begun to create a practitioner who possesses cognitive and psychomotor skills as well as exhibits professional behavior. Also, by emphasizing work on interdisciplinary teams and the use of evidenced based practices, the O&P professional of the future will provide an advanced level of judgment, decision making, and theory/research-based practice for veterans and others with traumatic injuries. We have incorporated the 14 Program Level Outcomes into a new Program Evaluation Plan that has been implemented.

SUGGESTED FUTURE WORK:

The CSUDH O & P Program strives to educate rehabilitation, Orthotics, Prosthetics and patient care professionals and foresees being identified as a Center for Teaching Excellence. External funding is needed to develop the Center.

The Center will focus on the following: Continuing to train post baccalaureate Certificate Orthotic and Prosthetic professionals; Reestablish a Combined O & P baccalaureate curriculum; Create a professional Masters degree (MPO) in prosthetics and orthotics; Create a post certificate education pathway for O & P certificate graduates to obtain the Masters degree; and Develop an Interdisciplinary post Masters program for graduates in related disciplines. Other foci will include expansion of the various programs through distance learning capability (Blackboard, Academy Online Education,

CAD/CAM, etc.) and full implementation of the CSUDH Program Evaluation Plan across all programs.

SO WHAT?

This modest investment of \$575,000 has expanded the number of Orthotic and Prosthetic graduates (by 8%) available to serve military amputees, older U.S. Veterans, and other Americans living with disabilities. If distance learning strategies are implemented in the future, even greater numbers of practitioner graduates are feasible. A new affiliation and clinical rotation with the military amputee center (C5) at San Diego Naval Medical Center was established. With the new Program Level Outcomes and Outcome Assessment Tools developed at CSUDH, other O&P schools should be able to more easily assess their students and evaluate the effectiveness of their curricula. Outcome assessment tools provide continuous feedback to improve student learning. These tools are useful in programs that train higher numbers of practitioners, in comparison with the older style programs that train only 12-14 students per year in laboratory intensive settings. Last, the CSUDH O&P Program is poised and ready to move to its new state of the art facility and increase service to injured veterans through its new affiliation with the Long Beach VA Medical Center.

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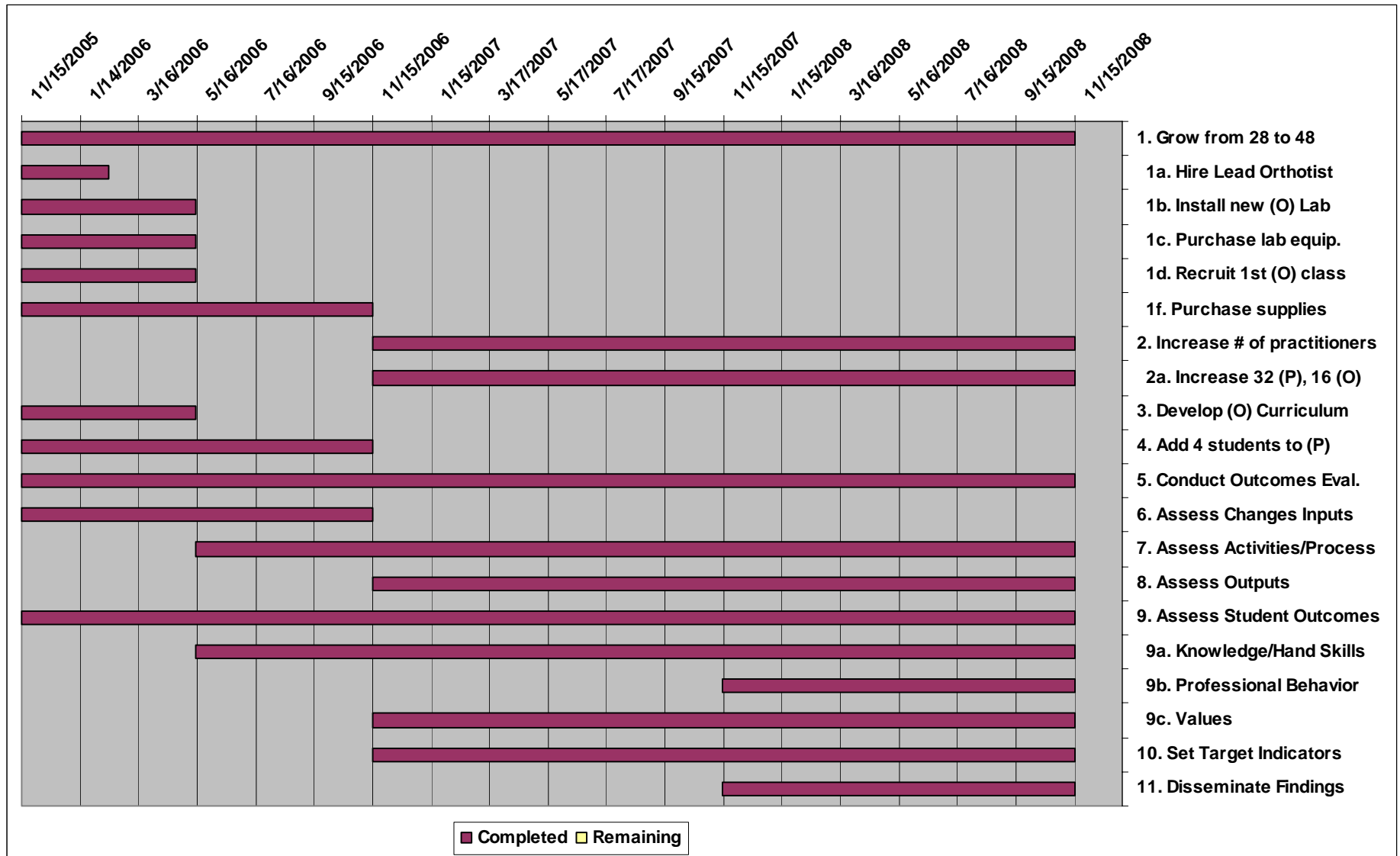
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APPENDIX I.

GANNT Chart: Accomplishment of Objectives



APPENDIX II.
Program Evaluation Plan

File attached: Program Evaluation Plan (1-9-09).pdf

APPENDIX III.
Photographs of New Orthotics Lab, New Gait Room, Expanded Prosthetics Lab
Photographs of Wounded Warriors Visit
Photographs of 151 Graduates (2005-2008)



New Orthotics Laboratory



Expanded Prosthetics Laboratory



New Gait Room



Revised Gait Courses



Wounded Warriors Visit from
Balboa Naval Hospital, San Diego



Wounded Iraq Veterans – July, 2007

CSUDH Produces
151 Graduates: 2006 - 2008



Prosthetics Certificate Class – Spring 2006



Orthotics Certificate Class – Spring 2006



Prosthetics Certificate Class – Fall 2007



Prosthetics Certificate Class – Spring 2007



Orthotics Certificate Class – Spring 2007



Prosthetic Certificate Class – Fall 2007



Prosthetics Certificate Class – Spring 2008



Orthotic Certificate Class – Spring 2008




Prosthetic Certificate Class – Fall 2008



Orthotic Certificate Class – Fall 2008


APPENDIX IV.

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November 1, 2008

Joining Forces

A short 70-mile trip is changing the lives of O&P students and impacting future care of returning military service members.

By Jennifer Hoydicz

Returning military service members have varying wounds including amputations, blast injuries and psychological scars. Through a collaboration between California State University (CSU), Dominguez Hills Orthotics and Prosthetics Program and the Naval Medical Center San Diego (NMCS D) Division of Comprehensive Combat & Complex Casualty Care (C5) Program, O&P students are getting a rare chance to work with injured service members returning from Operation Enduring Freedom and Operation Iraqi Freedom.

According to Scott Hornbeak CPO, program coordinator, CSU Dominguez Hills O&P Program, the collaboration was under discussion with Peter Harsch CPO, the head of the prosthetics division C5 at NMCS D for almost two years before the first students walked through the doors at NMCS D. Recognizing the rare opportunity to work with returning military amputees, the U.S. Navy invited the students in to share their knowledge as well as imPart their own.

Excited about giving the students this extraordinary opportunity, both men talked to *O&P Business News* about what this partnership can do for the future of O&P, comprehensive care and the learning process.


Specifications

Each Thursday since early September, NMCS D has welcomed a new team of O&P students to learn about amputee patient care. The program has been designed to allow each of the 16 current students in the CSU Dominguez Hills O&P program to visit the medical center at least once before the semester ends in December. Hornbeak is confident that many students will have the opportunity to visit NMCS D twice before the year ends. For now, they visit in teams of two making each visit different adding further value to each student's personal learning experience.

Harsch explained that the students have access to the newest technologies and techniques and they promote both clinical and technical freedom so almost nothing is off-limits in terms of participation in care, but that does not mean protocol is ignored.

"Every patient is asked if they are comfortable with having a student shadow us," Harsch explained adding that the majority of the patients have granted this request.

Also, students are expected to follow standard medical operating procedures such as patient privacy and HIPAA compliance.



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Preparation

To begin their acclimation to the new surroundings, students are first given a tour of C5 and an important briefing on some of the challenges they might face working with such a specific population.

Returning military service members present more challenges due to the nature of their wounds and the psychological ramifications of combat. Post-traumatic stress syndrome (PTSD) and issues with traumatic brain injury are just two of the special considerations the students received education about prior to their visit.

Military amputees returning from Afghanistan “have really high pain levels because of other injuries – ankles that are crushed, burns and tissue injuries. The students are starting to see that for some of these [soldiers] that are injured in the war that have amputations, that’s just one of the problems,” Hornbeak said. “There are so many other medical and psychological conditions that are going on. Some are visibly depressed. Some are in severe pain and are taking some kind of painkillers and it really affects you to see these young people with such severe injuries. Yes we are looking at the prosthetic rehabilitation but you can’t help but think about all the psychological rehabilitation that is required.”

To deal with the psychological ramifications, students have been instructed to be cautious and consider what they say and do.

Some of the students who have already visited NMCS D have had a chance to reflect on their experiences. Evan Markell, a current student in the CSU Dominguez Hills O&P program has previous military experience as a hospital corpsman and served in NMCS D, coincidentally where his rotation took place.

“I had some expectation as to the sensitivity of seeing patients that were coming back from Iraq and Afghanistan with traumatic injuries,” Markell told *O&P Business News*. “It’s a very sensitive issue and I made sure when I spoke to any patient, any wounded warrior there, to really gauge how much further I should go into how the injury occurred or what I should and shouldn’t say and took it on a per patient basis.”

Another student, Elisa de Jong, CO, came to the collaboration with no previous military experience and was anxious about her visit given the briefing they received beforehand.

“I was happily surprised that it wasn’t as intense as I thought it would be because we were expecting a lot,” de Jong told *O&P Business News*. “We were told to watch what we ask and it completely makes sense but when we got there... the [patients] that we saw were so open. It’s really neat to hear them talk and see how they’re coping with it.”

A unique experience

The treatment of war time amputees is a rare event and the students are really excited and enthusiastic about going to take part in their prosthetic care, Hornbeak said.

With only 70 miles separating the CSU Dominguez Hills campus and NMCS D, it was an opportunity the two entities could not pass up.

“There’s not been anything like this since Vietnam in terms of amputation care and sometimes it takes a war to advance technology prosthetics,” Hornbeak said. “At the three Department of Defense hospitals they are embracing a lot of high technology and that’s going to pull through for the benefit of all veterans.”



Brian Zalewski, C5 prosthetist shows Luis Mora, student in the CSU Dominguez Hills O&P Program how to apply a fiberglass wrap.

Harsch, a graduate of the CSU Dominguez Hills O&P program is happy to give back to his alma mater and thankful that the Navy offered this unique experience to students.

“I know that if I was a student I would be very grateful,” he said. “I wish I would have had this opportunity when I was in school to come and see something like this. My profession outside of the Navy and being a mentor to these students will hopefully bridge some of the challenges that prosthetists have with sharing education and experiences and being able to give back.”

Comprehensive care

NMCSD C5 offers the additional educational experience of working in a comprehensive care setting, one that many practitioners unaffiliated with the military see as a great way to manage care in the best interests of the patients overall health. Giving these students the chance to work in such a setting might encourage increased comprehensive care in the future.

"Students are getting a better understanding of what comprehensive care means," Harsch said explaining that NMCSD C5 houses such specialties as occupational therapy, psychology, physical therapy, an orthopedics team and case workers. "When you put all of that into place, you're going to get great results. When you can all focus on one goal for one patient the outcome is going to be a life-changing one."

Harsch is confident that these students will take this kind of comprehensive care out into the mainstream field of O&P.

"These students will be able to go out and be able to understand that if we worked in this team environment or if we collaborated with other medical specialties like physical therapy and occupational therapy, that their patients will have a higher probability of getting great outcomes and being able to...get integrated into life again – back to work, back into athletics or sports or whatever their goals," Harsch told *O&P Business News*.

Hornbeak, a proponent of the idea of a rehabilitation team agrees that this kind of comprehensive care is an ideal.

"It is a nice situation over there at the Navy hospital because the physical therapist is right next to the occupational therapist, [who] is right next to the prosthetic practitioners. It's seamless," Hornbeak said. "They have clinics with the doctors on Thursday and the patients don't have to go to some far flung clinic to get additional services."

Future care

The Navy's initial purpose for pursuing a partnership was to allow students a chance to become aware of the kinds of injuries that veterans will be walking into their O&P offices in the future; to give the students a chance to see how that care begins in an effort to continue in that care with more knowledge.

"It was an opportunity to have a class of students that will be familiar with not only the prosthetic fitting issues but understanding what each one of these individuals has gone through – going from a combat zone, understanding what they've been doing here for 12 to 18 months and that they are not here for just a basic fitting," Harsch said about the impact this partnership will have on future care. "It'll give them a true understanding of each of these [returning service people] when they come into their offices all over the country. It's a way that the Navy is able to continue the education and continue the care for these individuals once they leave here."



Harsch (center) shows students Mora and Rachel Hartsell how to create a stiffer heel.

By expanding an invitation to work with and shadow practitioners at NMCSD, the students are becoming familiar with the challenges associated with blast injuries so that they can use that knowledge for long-term care planning of war veterans that will flood offices around the country in years to come.

"The patients are very appreciative because they realize this is the younger, newer generation of prosthetists that will be around the next 40 to 50 years of their career," Harsch said. "The patients themselves have all opened doors allowing the students to see what they are going through and to understand because they realize there will be a day that they'll walk into an office years down the road and they might recognize one of the students. The feedback has been very positive from the service members and I think [they] recognize that the Navy has given these students an opportunity to come here and learn and educate and train and it's really for them. It's not for us. It's truly for the long-term care of these service members and I think they are appreciative of that."

Hands-on experience

"These are blossoming practitioners and frankly they are very open to new experiences," Hornbeak said. "They've done enough volunteer work or technical work that they're really not too shocked at what they're seeing."

This hands-on experience is adding a new dimension to the school, Hornbeak added. In addition to the weekly visits to NMCSD, the students share these experiences in the classroom setting to broaden everyone's knowledge and shed some light on the differences between the in-class education and that received in the field.

"I saw a casting which was very similar to what we learned in school," de Jong said adding that the difference is that it went beyond the basics of a textbook case or model patient. They teach you the basics in school which is good . . . and a lot more detailed and then when I saw [someone at NMCSD] take a cast it took him less than ten minutes just to wrap him up. It was great because with school we get patient models who we go through a whole project with – a casting, making a check socket, making a definitive socket and walking them. It's nice to see in a different setting what we're learning in school."

This kind of exposure produces the "aha" moments for students who finally see the end result of so much study.

"The students are being exposed in school to some of the same technology although they see more of it at NMCSD," Hornbeak told *O&P Business News*. "For instance, just about all transfemoral amputees get a microprocessor knee. All lower extremity amputees get some kind of a high profile, dynamic response carbon fiber foot. Just about every amputee that has an upper extremity amputation gets at least the option of receiving an externally powered arm, such as a myoelectric. Now they are fitting i-LIMBS and some of the other modern technology. Our students are getting exposed to that here but it's just a brief lecture about the i-LIMB – down there they are actually seeing them."

Treating the individual

One lesson that both Markell and de Jong expressed as invaluable was the idea of treating the individual.

"You need to look at each patient not as being a transtibial or whatever level amputation they've had," Markell said. "You have to look at them and take their whole package and really be sensitive to everything about the patient, especially with these wounded warriors. A lot of them do have PTSD so really as a whole you need to take the patient and treat them individually and encompass everything that they have going on in their lives."

de Jong echoed her classmate's sentiment adding that while she recognizes the value of her in-class education, this once-in-a-lifetime experience has allowed her to realize how much hands-on clinical practice aids in educating about those things that can not be simulated.

"Even though you learn the basics, you can't always go by the book," she said. "You learn by the book but . . . every patient's going to be different and in order to treat them effectively you may have to think outside the box."

The unique setting offered by NMCSD also allows for a patient feedback that is not always experienced in a traditional clinical setting. The patients form an unmatched camaraderie and talk about what components work for them and vice versa offering advice to one another.

"Each patient that you're treating really knows a lot about what you're doing," Markell said adding that he welcomed feedback to help him improve his skills for later clinical practice. "That's something I was really amazed by. These [patients] knew about alignment and they knew about feet and what they wanted to try and what they didn't want to try. Patient feedback is definitely something that you have to take into consideration so [it is important to] listen to the patient in general."



Harsch (center) shows Mora and Hartsell how to remove a side-spring.

Win-win situation

"The young amputee soldiers and marines relate to other young people so they love our students," Hornbeak said.

But the students are not the only ones taking something valuable away from the collaboration. This experience also allows the patients a chance to see what a career in O&P would be like – from the educational perspective and well as the clinical perspective. CSU Dominguez Hills invited some of the patients to the university for career orientation in mid-September

"We showed them some technology here at the school in case two or three of the soldiers might want to pursue O&P as a career," Hornbeak said. "It's another career option."

As long as the program is successful, Harsch and Hornbeak plan to continue with the next class of students in February 2009, an idea that current students think would be wise to make.

"It's really made me appreciate the field in general and just to be able to work with these patients and to see them so motivated to get on with their lives and to be active and use the devices that they were given was pretty inspiring," Markell said. "I think it's something that everyone in the field should experience."

Jennifer Hoydicz is the managing editor of *O&P Business News*.

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APPENDIX V.

Sample of New Biomechanics Syllabus – HEA 345
Sample of New Directed Research Syllabus – HSC 498

HEA 345-Kinesiology & Biomechanics of Orthotics and Prosthetics

Course Description: Normal and pathological motion as it applies to the theory of Prosthetic and Orthotic application will be discussed and examined. Primary areas of study will include applied anatomy, anthropometry, kinematics, and kinetics, gait, force vectors and component design. The course is structured to create solutions for real world clinical situations with emphasis on the interpretations of the results.

Unit value: 2

Pre- and/or Co-requisites: College algebra, physics, and anatomy

Course Instructor:

- Mark Muller, CPO Clinical Instructor
mmuller@csudh.edu
CHHS California State University Dominguez Hills
27402 Aliso Viejo Pkwy
Aliso Viejo, CA 92656
(949) 643 5374 ext 205
(949) 643 5337 fax
- Scott Hornbeak, CPO, FAAOP, Director, Clinical Instructor
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CHHS California State University Dominguez Hills
27402 Aliso Viejo Pkwy
Aliso Viejo, CA 92656
(949) 643 5374 ext 206
(949) 643 5337 fax

Office Hours: Immediately after class or by an appointment. Weekly discussion time on Blackboard from 8:00 pm to 9:00 pm Tuesdays.

Course Objectives/Learning Outcomes: Upon completion of this course, the student will be able to:

- ✚ Understand normal human locomotion and 6 determinants of gait.
- ✚ Define and appropriately use anatomical, directional and movement terminology.
- ✚ Demonstrate the ability to locate palpable anatomic landmarks.
- ✚ Demonstrate the ability to complete a full Range of Motion and Manual Muscle Test on an individual.
- ✚ Demonstrate the ability to identify and correct gait deviations in Prosthetics and/or Orthotics
- ✚ Understand statics and dynamics and identify internal and external forces associated with such problems.
- ✚ Set-up and solve quantitative kinetics problems, specifically force vector acting on human body
- ✚ Understand the center of gravity and know how to locate the center of gravity on human body.
- ✚ Understand the lever system and torque that causes the angular motion of the lever system

Required Text, Readings and Materials:

Smith, L.K., Weiss, E.L., & Lehmkuhl, L.D. (1996). **Brunnstrom's Clinical Kinesiology (5th Ed.)**. Philadelphia: F.A. Davis.

Smith, **Atlas of Amputations and Limb Deficiencies (3rd Ed.)** American Academy of Orthopedic Surgeons, Rosemont, IL, 2004

Daniels, **Muscle Testing Techniques of Manual Examination (7th Ed.)**, Suanders, Philadelphia, 2004

Recommended Text and Readings:

Blandine Calais-Germain. **Anatomy of Movement**, Eastland Press, Seattle, 1993

Clinical Aspects of Lower Limb Prosthetics, CAPO, Elgan, Ontario, Canada, 1991

Bowker, **Biomechanical Basis of Orthotic Management**, Butterworth, Oxford, England, 1993



Additional Requirements: Calculator; Access to Excel and Power Point.

Course Materials: The course syllabus, PP lecture presentation, and assignments are posted on the Blackboard of CSUDH website. You are encouraged to use this tool in facilitating your learning.

Websites: CSUDH.edu / Blackboard

Course Evaluation Strategies:

A minimum of C ($\geq 72\%$) letter grade is required to pass this course.

-  **Expectations:** You are expected to read the material and complete assignment prior to the class meeting. Two-hour homework is expected after each lecture.
-  **Due Dates/Make Up Policy:** Assignments are due at the beginning of class on the published date. Points will be deducted for a late work. No more than 50% of the original points will be earned for work submitted late. **A work submitted late more than one week will be not accepted.**

Grading:

Four Assignments:	40%
Mid Term Exam:	20%
Final Exam	40%

Overall average

93-100	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-77.9	C+
73-76.9	C
70-72.9	F

Description of Assignments:

Assignment 1:	Review of Math and Vector Calculation
Assignment 2:	Measurement of ROM and Joint movements.
Assignment 3:	Manual Muscle testing & Description of Human Motion and Terminology.
Assignment 4:	Center of Gravity, Force and Torque calculations.

Attendance Policy:

You are expected to attend all classes and be present for the entire time. If you will be absent you must let the instructor know prior to your absence. Please turn off all pagers and cell phones during class.

Academic Integrity:

All instances of cheating, plagiarism, copyright infringement, unethical or other inappropriate behavior will be brought to the attention of the Chair or Coordinator of your program. Plagiarism is defined as the act of taking ideas, writing, etc. from another source and passing them off as one's own. Following procedures consonant with due process pursuant to the State Administrative Code, A student may be expelled, suspended, placed on probation or given a lesser sanction (refer to your CSUDH *University Catalog*). Students may be required to submit their papers to www.turnin.com for analysis and evaluation of their original content.

Students with Disabilities:

Students with disabilities should contact the University Disabled Students Office for information regarding special accommodations at www.csudh.edu/dss/main.html.

Course Schedule Outline/Due Dates:

Date	Lecture Topic	Readings	Assignments Due:
08/16/07	Introduction to Normal Gait	Manual Intro Gait Atlas Sec 111, chapt 29, Perry, Normal Gait, Pg 353 -366	
08/24/07 *bring shorts**	Course Intro, terminology description of fundamental human motion. Palpation of human landmarks	Manual Biom #1 Lec Anatomy of Movement pg 1 -30, 98-98,176-177	
08/29/07	Normal Human Locomotion and 6 Determinants of Gait	Perry, Normal Gait, Pg 353 -366	
08/31/07 *bring shorts**	Joints, Levers, and Lab: ROM for lower and upper extremity. Types of motion, measurement of ROM, and Arthrokinematics, Levers	Manual: Biom #2 Lec Brunnstrom Chapter 1 Pg 1 -18	
09/04/07	Force convention, Newton's laws of motion, and lever systems	Manual: Biom #3 Lec Brunstrom Chapt. 2 pg 20 – 34	Assignment 1 <i>Math review</i>
09/07/07 *bring shorts**	Manual Muscle Testing	Manual: Biom #4 Lec Daniels, Muscle Testing Techniques Pg 1 -11, 61 - 140, 179 - 240	Assignment 2 <i>R.O.M & joints</i>
09/11/07 Mid term Exam <i>R.O.M., MMT planes, joints</i>	Torque, composition and resolution of forces, calculation of muscle and joint forces	Manual: Biom #5 Lec Brunstrom Chapt. 2 pg 35 – 68	Assignment 3 <i>M.M.T, motion & terms</i>
09/19/07 Final Exam (Take Home)	Application of orthotics and prosthetics component design, and Trans Tibial Biomechanics	Manual: Biom #6 Lec CAPO pg 59 -68 Bowkers Chapt 2 & 3	Assignment 4
09/25/07	Final Exam (Take Home) Due		

Other Biomechanics Lectures given in Prosthetics			
	Partial Foot Biomechanics	Symes notebook: CAPO pg 201-208	
	Symes Biomechanics and Rx	Symes notebook: Radcliff pg 76 -85 CAPO pg 175 178	
	TT Gait Deviations and Biomechanics	BKII Reader: CSUDH Gait Sheets	
	Hip Flexion and adduction TF	AK Notebook: UCLA “Hip flex Analysis” pg 1-5	
	TF Gait Deviations and Biomechanics	AK Reader: CSUDH Gait Sheets	
	TF Biomechanics frontal plane	AK Notebook: Anderson pg 129-146	
	TF Zone of Stability	AK Notebook: Knud Jansen Lec pg 146-160	
	Hip and Bilateral Biomechanics Trans Femoral Exam	-AK II Notebook: Radcliff pg 29-38 -Atlas Chapt 49	
	Upper Ext Biomechanics	Upper Reader: Atlas chap 8 Taylor JPO p 7-28 Taylor Chap 7 pg 169-221 Basic Biomechanics pg 1-5 Harness Biomechanics pg 1-18 UEP Biomechanics pg 1-8	
	Shoulder Disartic Biomechanics	Atlas Chap 21	

HSC 498 DIRECTED RESEARCH IN HEALTH SCIENCES
COURSE SYLLABUS: Fall 2008

FACULTY: Mark Muller
TELEPHONE: 949 241 7999 Cell
E-MAIL: mmuller@csudh.edu

LOCATION: Cal. State Clinical Laboratory at Ossur North America
TIME: 9 days, variable
OFFICE HRS: Mondays, 3-5 pm, and by appointment

Course Description: Advanced topics and research on specific subjects in Health Sciences as applied to the field of Prosthetics will be used to reinforce material covered by pre or co-required courses within the certificate program. Invited guest instructors will demonstrate latest evaluation and design techniques, interfaces, and components, and provide guidance in directed research topics for evidence based practice. Cap stone summary evaluations of clinical abilities and concepts will be assessed through participation in clinical examination. The use of current web-based modules will be made available on the American Academy of Orthotist and Prosthetist (Academy) On-Line Learning Center will be utilized for knowledge enhancement and reinforcement.

Units/Hours: 1 unit; course consists of 4 hours of lecture and demonstration per day for 9 days. Total 21 hours; includes summary practical examination and online courses.

Required Text:
To be Determined

Prerequisite:
Enrolled in the Prosthetic Certificate Program for Fall 2007

Course Requirements:

- Membership with the AAOP at the Resident level.
<http://www.oandp.org/membership/>
- Access to high speed internet

Course Objectives and Expected Outcomes:

- 1) Promote competency and enhance professional practice.
- 2) Provide evidenced based, clinically competent care through current methods use in clinical practice.

This course will utilize accrued knowledge from the Prosthetic Certificate program to allow the student to be more aware of new and emerging technologies in the field of prosthetics. Outside lectures, Clinical Practicals and On-Line courses will be used to enhance the student's education and reinforce these objectives.

Evaluation of Learning and Grading Criteria:
The students will be able to demonstrate ability to participate in personal and professional development through continuing education, training, research, and organizational affiliations.

Clinical Exams: The Clinical Practical examination account for most of the evaluation to determine the level of knowledge acquired throughout the Prosthetic Certificate Course. They will be utilized as an evaluation of practitioner competency. The exams are held over two days and consist of multimedia-

based clinical evaluation and problem solving exams, oral exams, task-orientated problem solving exams and laboratory practicals.

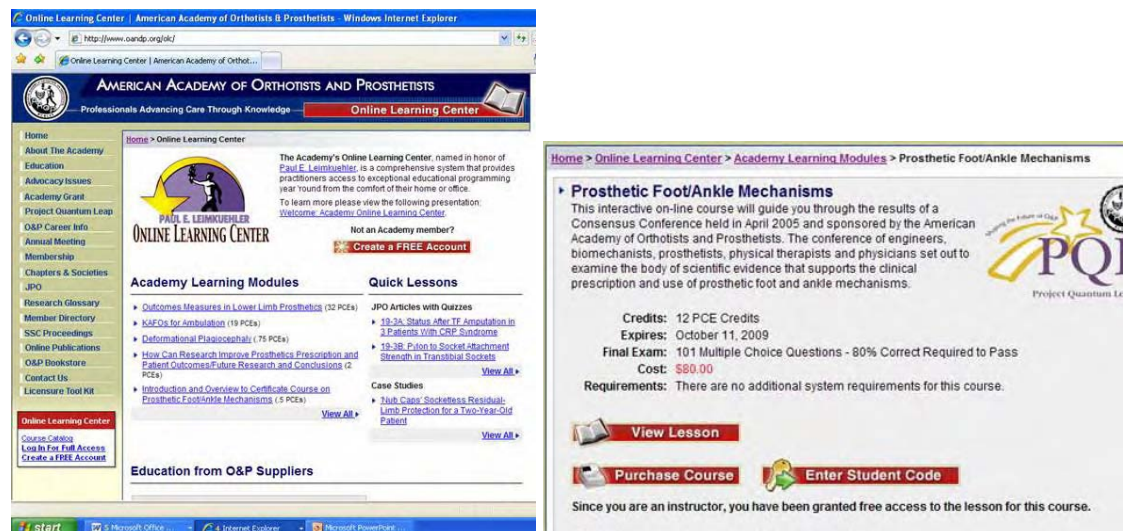
On-Line Modules: To enhance professional practice and provide means for evidence based practice each student will complete the assigned modules from the Academy's On-Line learning Center's web site. The On-Line modules allow the student to review the material at their leisure and absorb the material at their own pace. The students will be allowed to view the modules as many times as needed and retake the assessment as many times as needed to achieve a passing score. These web-based modules are current topics of prosthetic theory and demonstrate the use of evidence based practice. These modules were created by the Academy for currently certified and licensed prosthetic and orthotic professionals as a means of gaining continuing education units. The Academy has given permission and course administration privileges to CSUDH to utilize these modules as teaching aides. The assessment of knowledge will be a passing score on each module's exam. A minimum score of 80% is required to pass the exam. Quizzes will be a combination of multiple choice, true/false, fill in, and short answer. The Academy maintains a database so the students and faculty can view number assessment attempts, the score of the attempts and the incorrect answers.

Guest Lecturers: Current practice techniques and methods will be demonstrated through a series of guest lecturers that will be scheduled throughout the semester. There will be a total of ten guest lecturer covering topics of clinical techniques, clinical decision making, product selection, billing practices, innovated technologies and how to utilize available research within evidence based practice. Participation in Guest lecturer presentation will be required and may be accompanied by a quiz.

Access to the Academy's On-Line Learning Center.

Each of the assigned modules can be found at The Academy's Online Learning Center:

<http://www.oandp.org/olc>



- Go to the **Academy Learning Modules** and select the module.
- Select one of the assigned learning module
- Select the button **Enter Student Code**
- Enter the unique **Course Code** given below
- Complete the module and take the exam
- A minimum of 80% is required. Multiple attempts are allowed.
- Complete all modules by the assigned due date.

View Exam results and Print them. These questions may be used on future exams.

- Utilize *Print Page* (Control P or Command P (Mac)) or *Print Screen* (Command, Shift, 3 for Mac) and insert the image in to a Word Document

If you failed the exam, then click **Try Again** for an additional attempt.

- You may view the lesson over if needed.

If you passed the exam, the click Close Window

The exam score, number of attempts and survey responses will be placed in a file for the instructor to review. The exam's passing score will then be transferred to BlackBoard as part of the Directed Research course grade.

Here are the assigned OLC courses for Orthotic and Prosthetic students.

Orthotic Students codes and courses:

	Code	Course
<input checked="" type="checkbox"/>	CSUDH F-08 Lower 3	Knee-Ankle-Foot Orthoses for Ambulation
<input checked="" type="checkbox"/>	CSUDH F-08 Lower 2	Functional Limitations from Pain Caused by Repetitive Loading on the Skin: A Review and Discussion for Practitioners, with New Data for Limiting Friction Loads (JPO 18-4A)
<input checked="" type="checkbox"/>	CSUDH F-08 Lower 1	Orthotic Treatment of the Neuropathic Foot
<input checked="" type="checkbox"/>	CSUDH F-08 Spinal 2	Orthotic Treatment of Idiopathic Scoliosis and Scheuermann's Kyphosis
<input checked="" type="checkbox"/>	CSUDH F-08 Spinal 1	Orthotic Treatment of Deformational Plagiocephaly, Brachycephaly and Scaphocephaly
<input checked="" type="checkbox"/>	CSUDH F-08 Upper 2	Brachial Plexus Injury - A Case Study in Prostheses
<input checked="" type="checkbox"/>	CSUDH F-08 Upper 1	Custom Shoulder Abduction/Rotation Orthosis in Post-Operative Management of Brachial Plexus Injury Following Modified L'Episcopo Procedure (JPO 17-3B)

Prosthetic Students codes and courses:

Code	Course
<input checked="" type="checkbox"/> CSUDH_9_F08	Testing a Prosthetic Haptic Feedback Simulator with an Interactive Force Matching Task (JPO 20-2B)
<input checked="" type="checkbox"/> CSUDH_8_F08	New Possibilities for Upper Extremity Prosthetics
<input checked="" type="checkbox"/> CSUDH_7_F08	'Nub Caps' Socketless Residual-Limb Protection for a Two-Year-Old Patient with Bilateral Knee Disarticulation Amputations
<input checked="" type="checkbox"/> CSUDH_6_F08	Relative Strength of Pylon to Socket Attachment Systems Used In Transtibial Composite Sockets (JPO 19-3B)
<input checked="" type="checkbox"/> CSUDH_5_F08	Dermatological Problems with Prosthetic Roll-on Liners - 2007 Thranhardt Lecture
<input checked="" type="checkbox"/> CSUDH_4_F08	Lower-Limb Prosthetics Society: The Interfaces between the Transtibial Residual Limb and the Socket Design
<input checked="" type="checkbox"/> CSUDH_3_F08	Gait Mechanics of the Transtibial Amputee
<input checked="" type="checkbox"/> CSUDH_2_F08	Rationale and Practice of Prescribing Prosthetic Feet (Module 4)
<input checked="" type="checkbox"/> CSUDH_1_F08	Prosthetic Foot/Ankle Mechanisms

Prosthetic Students Optional Courses:

Code	Course
<input checked="" type="checkbox"/> CSUDH RUNNING4	The Biomechanics of Lower-Limb Amputee Sprinting and Distance Running
<input checked="" type="checkbox"/> CSUDH RUNNING3	Prosthetic Component Considerations for Amputee Athletes
<input checked="" type="checkbox"/> CSUDH RUNNING2	The Biomechanics of Lower-Limb Amputee Running
<input checked="" type="checkbox"/> CSUDH RUNNING1	The Essentials of Lower-Limb Amputee Running

Due Dates:

The due dates for the Academy On-Line modules will be spread out throughout the semester. The specific dates will be assigned within concurrent courses and will be specific to that course. For example; the due date for the module titled Prosthetic *Foot/Ankle Mechanisms* will be assigned in transtibial prosthetics and will be due by the date of the trans tibial prosthetic final exam.

Weights of assignments:

- **Clinical Practical Examinations** **50%**
Average of Upper Limb and Lower Limb Exams
2 lab practical, 2 oral exams, 2 video gait deviation exams, 2 laboratory exams
- **Academy's Online Courses** **30%**
- **Participation at Guest Lectures** **20%**

Regular attendance is required for all classes. The absent student will be responsible for informing the program by calling the program's telephone number, (949) 643 - 5374, before the start of the class. A prior request shall be made to the instructor for non-emergency absences. Any absence from class requires that the missed material, quizzes, and tests be made up, by arrangement with the course instructor.

Program Grading Policy:

The letter grade for the course will be based upon the following:

A	>93%	B-	80 - 82%
A-	90 - 92 %	C+	77 - 79%
B+	87 - 89 %	C	73 - 76%
B	83 - 86 %	F	<72%

Academic Integrity and Plagiarism:

Academic Integrity is of central importance in the university community and involves committed allegiance to the values, principles, and code of behavior held to be central in that community. Integrity concerns honesty and implies being truthful, fair, and free from lies, fraud, and deceit. The core of a university's integrity is its scholastic honesty.

Plagiarism means copying of another person's work, or having someone else write a paper for you, falsely calling yourself the author, and paraphrasing or copying text without proper citations. Plagiarism is considered a gross violation of the University's academic and disciplinary standards.

Cheating and plagiarism are cause for formal university discipline and is justification for an instructor to fail the student or assign a lower grade. Refer to the current University Catalog for a more complete description of academic dishonesty and plagiarism.

APPENDIX VI.
Rubrics for Oral Communication
and Sample Trans-tibial Checkout

ORAL PRESENTATION ASSESSMENT

HEA 440 Upper Extremity Orthotics

Name: _____

Date: _____

Project Title: _____

Patient Model: _____

	Target 10	Acceptable 7.5	Emergent 5	Unacceptable 2.5	Score
Organization	Information was organized in a logical sequence that was easy to follow throughout.	Student presented information in organized manner.	Student presented information in a random sequence that was difficult to follow.	Student presented information in an unorganized & confusing manner.	
Delivery	Student projected a professional demeanor. The delivery was well rehearsed. Important information was emphasized.	The delivery was appropriate.	The delivery was spotty with awkward moments.	Student was not prepared. The delivery was awkward throughout.	
Eye Contact	Student maintained eye contact with the audience, only occasionally refers to notes.	Student maintained eye contact most of the time but frequently returned to notes.	Student mostly read from notes. Occasional eye contact with the audience.	Student read from notes. Little to no eye contact with the audience.	
Elocution	Student used a clear voice, precise pronunciation of terms & indicated enthusiasm through verbal & nonverbal energy.	Student used a clear voice, pronounced most terms correctly & could be heard by most of the audience.	Student used a low voice, incorrectly pronounced terms & was difficult to hear during portions of the presentation.	Student mumbled, incorrectly pronounced terms & spoke too quietly for the audience to hear.	
Content Knowledge	Student demonstrated full knowledge of the information with explanations & elaborations.	Student at ease with the information but seldom elaborated.	Student uncomfortable with information & answered only rudimentary questions.	Student did not understand the information & could not answer questions.	

Comments:

Fib head	1								
Tib tubercle	1								
Patella	1								
Hamstrings	1								
Posterior shelf 3/4"	1								
Pressure Areas:									
Patella tendon	1								
Ant Compartment	1								
Medial Flare	1								
lateral Shaft Fib	1								
Popliteal	1								
Gastroc Bulge	1								
Positive Model:									
Smooth Surface Finish	1								
Smooth Contours /									
Anatomical	1								
Total	29	0	0	0	0	0	0	0	0

Critique Form

Course:

BK

Project # 2: PT

Student:	Burcham, Robert	Forrester, Scott	Hendley, Elizabeth	Kanallakan, Tim	Kingsley, Aileen	Koch, Benjamin	Lee, Clifton	McDonald,Tony	Pfleger, Joseph
Fitting:	Possible pts.								

Flex to 90°	5									
Px comfortable	5									
Adequate Sock ply	5									
Lateral Trim Accptable	5									
Anterior Trim Acceptable	5									
Fit acceptable	10									
Did not hurt pt.	5									
Sub Total:	40	0	0	0	0	0	0	0	0	0
Alignment:										
Pelvis Level	1									
Pylon ⊥ to floor	1									
A- P Foot placement 1"	5									
M-L Foot Placement 1/2"	5									
Suspension	5									
Smooth Gait	20									
Sub Total:	37									
Cosmetics:										
Smooth edges	1									
Smooth lines	1									
Appearance	1									
Sub Total:	3	0	0	0	0	0	0	0	0	0
Overall:										
Presentation/demeanor:	10									
Participation:	5									
Extra:	5									
Sub Total:	20	0	0	0	0	0	0	0	0	0
Total:	100	0	0	0	0	0	0	0	0	0

APPENDIX VII. CSUDH PROSTHETIC GRADUATE QUESTIONNAIRE

Graduate Name: _____

Residency Dates: _____ Residency Program: _____

This survey is designed to assist in assessing the effectiveness of our program's training and the quality of education it provides. Circle the number following each statement that best describes your evaluation of your learning.

5=excellent 4=good 3=satisfactory 2=marginal/needs improvement 1=unsatisfactory NA=not applicable

Overall Rating

My knowledge and skill preparation for an entry level position as a prosthetist.

5 4 3 2 1 N/A

Knowledge Base (Cognitive Domain)

1. Application of anatomy, pathophysiology, injury process, and impairments in relationship to prosthetics-orthotics treatment plan.

5 4 3 2 1 N/A

2. Formulation of comprehensive treatment plans integrating knowledge of biomechanics, kinesiology, gait, and material and component selection to improve function and meet patient/client needs.

5 4 3 2 1 N/A

3. Provision of evidence-based care by application of knowledge from research, literature review, and new sciences to the orthotic-prosthetic treatment plan.

5 4 3 2 1 N/A

4. Upper Limb Prosthetics, as a complete course:

5 4 3 2 1 N/A

Trans Radial

5 4 3 2 1 N/A

Trans Humeral

5 4 3 2 1 N/A

UEP Biomechanics

5 4 3 2 1 N/A

UEP Components

5 4 3 2 1 N/A

External Power (Myo, switch, etc)

5 4 3 2 1 N/A

5. Transtibial Prosthetics, as a complete course:

5 4 3 2 1 N/A

Patellar Tendon Bearing

5 4 3 2 1 N/A

Total Surface Bearing

5 4 3 2 1 N/A

Transtibial Biomechanics

5 4 3 2 1 N/A

TT. Prescription Criteria

5 4 3 2 1 N/A

TT Suspension Systems

5 4 3 2 1 N/A

Symes

5 4 3 2 1 N/A

6. Transfemoral Prosthetics, as a complete course:

5 4 3 2 1 N/A

Quadrilateral

5 4 3 2 1 N/A

Ischial Containment

5 4 3 2 1 N/A

Transfemoral Biomechanics

5 4 3 2 1 N/A

TF Prescription Criteria

5 4 3 2 1 N/A

TF Suspension Systems

5 4 3 2 1 N/A

Knee Disarticulation

5 4 3 2 1 N/A

7. Post-operative treatment techniques/protocols:

5 4 3 2 1 N/A

8. Hip Disarticulation/Hemipelvectomy

5 4 3 2 1 N/A

9. Partial Feet Prosthetics	5	4	3	2	1	N/A
10. Pediatric Prosthetics	5	4	3	2	1	N/A
11. Geriatric Prosthetics	5	4	3	2	1	N/A
12. Modular Systems/Componentry	5	4	3	2	1	N/A
Feet	5	4	3	2	1	N/A
Knees	5	4	3	2	1	N/A
Interface Materials	5	4	3	2	1	N/A
Roll On Systems	5	4	3	2	1	N/A
13. Activity Specific Prosthetics (Run, swim, shower, etc.)	5	4	3	2	1	N/A

Clinical Practice Proficiency (Psychomotor Domain)

1. My ability to perform comprehensive assessments of the patient using standardized assessment tools and skills.	5	4	3	2	1	N/A
2. My ability to utilize common safety procedures and universal precautions on behalf of patients.	5	4	3	2	1	N/A
3. My proficiency in using laboratory equipment and supplies correctly, safely and efficiently to maintain a safe and secure laboratory and clinical environment.	5	4	3	2	1	N/A
4. My proficiency in impression and measurement techniques.	5	4	3	2	1	N/A
5. My ability to use appropriate procedures and manufacturing processes in the provision of prosthetic-orthotic services.	5	4	3	2	1	N/A
6. My ability to document using established record-keeping techniques to record patient assessment, treatment plans, billing and reimbursement.	5	4	3	2	1	N/A

Behavioral Skills (Affective Domain)

1. My ability to demonstrate sound ethical and professional judgment in clinical patient/client management.	5	4	3	2	1	N/A
2. My ability to effectively communicate orally or in writing with patient, caregiver, and other health care personnel.	5	4	3	2	1	N/A
3. My skills in working in interdisciplinary teams on behalf of patient/client care.	5	4	3	2	1	N/A
4. My awareness of the patient/client's psychosocial status, and application in relation to prosthetic-orthotic treatment plan.	5	4	3	2	1	N/A

CSUDH GRADUATE QUESTIONNAIRE

1. Please comment below on any survey responses from the previous page of “2 = marginal/needs improvement” or “1 = unsatisfactory”:
2. If you could make three changes to improve the quality of the CSUDH Orthotic Program, they would be:
3. In which specific areas of Orthotics were you least prepared?
4. Which content areas or topics need more time or attention in our curriculum? Was there a topic which could be removed from the curriculum?
5. Do you feel you were allowed enough time with the patient/student models in each section to maximize your learning? If not, please elaborate.
6. Do you feel the tests, quizzes, practicals and critiques were adequate in content and frequency?

APPENDIX VIII.

EMPLOYER QUESTIONNAIRE FOR CSUDH GRADUATES

Graduate Name: _____

Residency Dates: _____ Residency Program: _____

This survey is designed to assist in assessing the effectiveness of our program's training and the quality of education it provides. Circle the number following each statement that best describes your evaluation of your Resident's abilities.

5=excellent 4=good 3=satisfactory 2=marginal/needs improvement 1=unsatisfactory NA=not applicable

Overall Rating

Knowledge and skill preparation for an entry level position as a prosthetist or orthotist (circle one)

5 4 3 2 1 N/A

Knowledge Base (Cognitive Domain)

1. Application of anatomy, pathophysiology, injury process, and impairments in relationship to prosthetics-orthotics treatment plan.

5 4 3 2 1 N/A

2. Formulation of comprehensive treatment plans integrating knowledge of biomechanics, kinesiology, gait, and material and component selection to improve function and meet patient/client needs.

5 4 3 2 1 N/A

3. Provision of evidence-based care by application of knowledge from research, literature review, and new sciences to the orthotic-prosthetic treatment plan.

5 4 3 2 1 N/A

FOR PROSTHETICS ONLY:

4. Upper Limb Prosthetics (overall):

5 4 3 2 1 N/A

5 4 3 2 1 N/A

5 4 3 2 1 N/A

5. Transtibial Prosthetics (overall):

5 4 3 2 1 N/A

5 4 3 2 1 N/A

5 4 3 2 1 N/A

6. Transfemoral Prosthetics (overall):

5 4 3 2 1 N/A

5 4 3 2 1 N/A

5 4 3 2 1 N/A

7. Post-operative treatment techniques/protocols:

5 4 3 2 1 N/A

8. Hip Disarticulation/Hemipelvectomy

5 4 3 2 1 N/A

9. Partial Feet Prosthetics

5 4 3 2 1 N/A

10. Pediatric Prosthetics

5 4 3 2 1 N/A

11. Geriatric Prosthetics

5 4 3 2 1 N/A

12. Activity Specific Prosthetics

5 4 3 2 1 N/A

(Run, swim, shower, etc.)

FOR ORTHOTICS ONLY:

4. Upper Limb Orthotics (overall):	5	4	3	2	1	N/A
Metal systems	5	4	3	2	1	N/A
Plastic devices	5	4	3	2	1	N/A
Off-the-Shelf devices	5	4	3	2	1	N/A
5. Spinal Orthotics (overall):	5	4	3	2	1	N/A
Post-op TLSO/LSO systems	5	4	3	2	1	N/A
Cervical orthoses	5	4	3	2	1	N/A
Scoliosis	5	4	3	2	1	N/A
Cranial Remolding Helmets	5	4	3	2	1	N/A
HALO systems	5	4	3	2	1	N/A
Seating and Mobility	5	4	3	2	1	N/A
Off-the-Shelf devices	5	4	3	2	1	N/A
6. Lower Limb Orthotics (overall):	5	4	3	2	1	N/A
Foot Orthoses, UCBL's	5	4	3	2	1	N/A
Metal AFO systems	5	4	3	2	1	N/A
Plastic AFO systems	5	4	3	2	1	N/A
Metal KAFO systems	5	4	3	2	1	N/A
Plastic/Hybrid systems	5	4	3	2	1	N/A
HKAFOs and RGOs	5	4	3	2	1	N/A
Off-the-Shelf devices	5	4	3	2	1	N/A
7. Pediatric Orthotics	5	4	3	2	1	N/A

Clinical Practice Proficiency (Psychomotor Domain)

1. Ability to perform comprehensive assessments of the patient using standardized assessment tools and skills.	5	4	3	2	1	N/A
2. Ability to utilize common safety procedures and universal precautions on behalf of patients.	5	4	3	2	1	N/A
3. Proficiency in using laboratory equipment and supplies correctly, safely and efficiently to maintain a safe and secure laboratory and clinical environment.	5	4	3	2	1	N/A
4. Proficiency in impression and measurement techniques.	5	4	3	2	1	N/A
5. Ability to use appropriate procedures and manufacturing processes in the provision of prosthetic-orthotic services.	5	4	3	2	1	N/A
6. Ability to document using established record-keeping techniques to record patient assessment, treatment plans, billing and reimbursement.	5	4	3	2	1	N/A

Behavioral Skills (Affective Domain)

- | | | | | | | |
|---|---|---|---|---|---|-----|
| 1. Ability to demonstrate sound ethical and professional judgment in clinical patient/client management. | 5 | 4 | 3 | 2 | 1 | N/A |
| 2. Ability to effectively communicate orally or in writing with patient, caregiver, and other health care personnel. | 5 | 4 | 3 | 2 | 1 | N/A |
| 3. Skills in working in interdisciplinary teams on behalf of patient/client care. | 5 | 4 | 3 | 2 | 1 | N/A |
| 4. Resident's awareness of the patient/client's psychosocial status, and application in relation to prosthetic-orthotic treatment plan. | 5 | 4 | 3 | 2 | 1 | N/A |

Please comment below on any survey responses from the previous page of “2 = marginal/needs improvement” or “1 = unsatisfactory”:

If you could make three changes to improve the quality of the CSUDH Orthotic and Prosthetic Program, they would be:

APPENDIX IX.
CSUDH PATIENT SURVEY
(Confidential: Student will only hear feedback from Instructors)

Please provide comments on your student practitioner's performance on the fitting of your prosthesis or orthosis. This information will be used to help your student improve their professional behavior.

Student Practitioner: _____ Today's date: _____

Please rate the statements according to the following scale:
5=Excellent 4=Good 3=Average 2=Below Average 1=Did not complete NA=not applicable

The following skills and tasks were completed by my student as part of this fitting:

1. Introduction						
- Used appropriate language	5	4	3	2	1	N/A
- Made me feel comfortable	5	4	3	2	1	N/A
- Treated me with courtesy	5	4	3	2	1	N/A
2. Evaluation and Measurement						
- Listened						
- Asked me about my daily activities	5	4	3	2	1	N/A
- Helped me sit or stand	5	4	3	2	1	N/A
- Well organized	5	4	3	2	1	N/A
- Acted professionally	5	4	3	2	1	N/A
4. Casting and Fitting:						
- Made sure my skin was clean						
- Fit the device gently	5	4	3	2	1	N/A
- Kept me safe	5	4	3	2	1	N/A
- Checked me often for painful spots	5	4	3	2	1	N/A
- Told me when to return	5	4	3	2	1	N/A
5. General Behavior:						
- Polite and respectful	5	4	3	2	1	N/A
- Was aware of me as an individual	5	4	3	2	1	N/A
- Honest	5	4	3	2	1	N/A
- Was sensitive to my needs	5	4	3	2	1	N/A

If you could make two changes to improve the quality of your student's performance, they would be:
 Behavior: _____

Skill: _____

APPENDIX X: “What We Assess Matrix”
Sorted by Cognitive, Pyschomotor, and Afferent Skills and Knowledge for 3 ABC
Domains

File attached: What We Assess Matrix_3 ABC Domains.pdf

APPENDIX XI.
CAAHEP Accreditation in Orthotics and Prosthetics



**Commission on
Accreditation**

OF ALLIED HEALTH EDUCATION PROGRAMS

The Commission on Accreditation of Allied Health Education Programs
certifies that the

Orthotics Program- Certificate

California State University
Carson State University

has completed an accreditation review and is judged to be
in compliance with the nationally established standards
this 17th day of November 2006 and expiring the 30th day of November 2009.

President, Board of Directors

Chair, Committee on Accreditation



Commission on Accreditation

OF ALLIED HEALTH EDUCATION PROGRAMS

The Commission on Accreditation of Allied Health Education Programs
certifies that the

Prosthetics Program

California State University
Carson, California

has completed an accreditation review and is judged to be
in compliance with the nationally established standards
this 20th day of May 2005.


President, Board of Directors


Chair, Committee on Accreditation

APPENDIX XII.
List of Personnel and Cumulative Costs as of 12/15/08
Quarterly Report Format

1. Award No. W81XWH-06-1-0144
2. Report Date: 01/09/2009
3. Reporting period: 08/16/2008 through 12/15/2008
4. Principal Investigator: Scott Hornbeak
5. Telephone No.:(949) 643-5374
6. Award Organization: California State University Dominguez Hills Foundation
7. Project Title: Program Evaluation of Outcomes Based Orthotic and Prosthetic Education
8. Current staff, role and percent effort of each on project.

STAFF MEMBER	ROLE	% EFFORT
Scott Hornbeak (Year 1-3)	PI	20%
Kate Muller (Year 1 only)	Lead Instructor	100%
Glenn Ham-Rosebrock (Year 1)	Instructor	50%
Marvin Ramirez (Year 1-3)	Lab Assistant	20%

9. Contract expenditures to date (as applicable):

COST ELEMENTS	THIS QUARTER	CUMULATIVE
Personnel	6,400.00	193,733.15
Fringe Benefits	663.75	9,953.88
Supplies	0.00	100,422.09
Equipment	0.00	125,341.69
Travel	0.00	8,048.45
Research Related Subject	0.00	22,480.58
Other Direct Costs	0.00	0.00
Subtotal	7,063.75	459,979.84
Indirect Costs	565.10	26,771.05
Fee	0.00	0.00
Total	7,628.85	486,750.89

APPENDIX II. PROGRAM EVALUATION PLAN

The O & P program evaluation plan is consistent with the Statement of Work (SOW) in the proposal and designed to be outcomes and competency based, to provide-data based information to make programmatic decisions, and to provide evidence of program quality and effectiveness. Program Evaluation answers the question: To what extent do additional resources increase program quality and effectiveness?

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
<u>Inputs & Outputs:</u>				
1. Student Enrollment - Increase applications - Increase inquiries - Increase print and web publicity	Increase enrollment from 28 to 48 annually	Advertise quality of program via web and journals. Also recruitment at national O&P meetings.	40 students in 2006 48 students in 2007 48 students in 2008	Advertising & web are working. Need to reach out to community high schools and community colleges.
2. Faculty Hiring	Increase # of faculty to accommodate enrollment and augment faculty expertise.	Track workload. Assess student perception of advisement and faculty availability	1 new faculty in 2006 1 new faculty in 2007	New faculty meet increased enrollments. Faculty bring expertise in Orthotics and distance learning strategies. Need to enhance research expertise.
3. Reduce National and VA shortage of ABC certified practitioners.	Show percentage reduction in national and VA shortage by DH placements.	Track VA and National shortage and hiring records each year.	28 additional students hired each year (ongoing). Of national Px shortage (47%) and Ox shortage (21%), new DH graduates have reduced shortage by 20 hires, est. 8%.	Reduced of shortage by 8%. Placement of DH graduates in 2 VA residency sites each year.
4. Laboratory Space and Equipment	Number of benches and equipment list available for new enrollment.	Procure space, benches, and equipment to meet enrollment needs.	900 sq. ft laboratory built. Procured 18 benches. Installed LCD system, electrical, and plumbing. Moved main classroom and added 4 machines to existing machine room.	New space and machines accommodate additional 20 students. New classroom accommodates 36 students.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
<u>Service to O&P Clients:</u> 1. Number of clients obtaining O&P services.	Patients served (O&P devices delivered) per practitioner per year. Includes use of digital technology such as CAD/CAM, web, computer databases, etc.	Calculate # of patients served by practitioner per year utilizing modern practice methods. Extrapolate increased annual enrollment to increased client services. (Use average of 8.5 visits per practitioner per day)	Clients affected: At 8.5 clients seen per day, each new graduate will see 2125 clients per year. Managers will effectively see (3X) or 6375 per year. Practitioner/Mgr. ratio=3:1. Therefore class of 48 treats (at 36:12 ratio) = 153,000 clients seen per year.	CSUDH capacity growth is beneficial to national practitioner deficit. Distance learning strategies could increase capacity in future.
2. Satisfied clients.	Patient Satisfaction is maintained at 80% or above on satisfaction scale.	Patient Survey (scale) includes perception of student performance in assessment, planning, and implementation. Patient assesses quality of service. Patient assesses safety and comfort of student services.	Original Patient Survey did not generate useful data. Patients either “liked” or “disliked” their students.	Revise Survey and implement in Spring 2009.
3. Satisfied employers.	Employer Satisfaction is maintained at score of 80% or above on the Employer Survey.	Employer Questionnaire includes perception of DH graduate quality in assessment, treatment plan, technical implementation and follow up. Also surveys quality of relationships with patients, peers, and supervisors.	Have not obtained data in past 2 years. Data obtained did not address several new PLO’s. embraced in past 2 years.	Revise Questionnaire to include feedback on ethics, cultural and psychosocial awareness, relationship building, and teamwork.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
<p><u>Student Learning:</u> The first six (6) Program Level Objectives (PLOs) are extracted from the Domains of Practice identified in the American Board for Certification (ABC) in Orthotics Prosthetics and Pedorthics, Inc. (2007). The remaining eight (8) PLOs are derived from the Pugh Commission Report (2006) and the National Commission on Orthotic and Prosthetic Education (NCOPE) (2006).</p>	<p>The 14 PLOs are student centered and measurable; that is, at the conclusion of the program, the student will demonstrate ability to:</p> <p>PLO's are measurable when using tools designed to elicit evidence of achievement in specific assignments designated as Program-Level Assessment(s). Direct measures provide evidence of learning as identified in the PLO's. Indirect measures provide evidence of program quality via perception reports (see Methods).</p>	<p>Program-level Direct and indirect measures (tools) used to elicit data to provide evidence of 1) achievement of PLOs (student learning) and/or 2) provide support/ evidence of program quality.</p>		
<p>1.Perform a comprehensive assessment</p>	<p>Demonstrate ability to obtain an understanding of the patients needs.</p>	<p><u>Program-Level Outcomes (PLO's) Assessment(s)</u></p> <p><u>Direct:</u> Clinical Preceptor Case Studies, Logs, and Clinical Preceptor Evaluation.</p>	<p>Achievement of PLO's = evidence of (1) learning and (2) preparation for successful ABC scores.</p> <p>Results of Direct assessment methods: Sampling of student materials, 2007 & 2008, from Clinical Preceptor Case Study reports,</p>	<p>Conclusion related to Direct assessment methods: Identified methods are obtaining data to support evidence of learning.</p>

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
2. Formulate a comprehensive treatment plan	Demonstrate ability to meet the needs and goals of the patient.	Same as PLO 1.	Clinical Logs, and Clinical Preceptor Evaluation reports suggest evidence of PLO 1 through 4 achievement and therefore, learning as stated in these outcomes.	Action related to Direct assessment methods: Continue to collect and analyze data from identified methods post Clinical Preceptor experience. Also, strengthen Case Study and Log assignments in syllabus to insure that student feedback regarding their learning is addressed.
3. Implement the prescribed treatment plan	Demonstrate ability to perform the necessary procedures to deliver the appropriate services including fabrication.	Same as PLO 1 and 2.		
4. Follow up the treatment plan.	Demonstrate ability to provide continuing patient care and periodic evaluation to assure optimal fit and function.	Same as PLO 1, 2, and 3. <u>Indirect:</u> Patient Survey and Orthotic or Prosthetic (O/P) Graduate Questionnaire	Results of Indirect assessment methods: Patient Survey responses were not adequate, focused or specific nor administered consistently. Original Graduate Survey did not elicit pertinent data regarding learning; therefore, the document, O/P Graduate Questionnaire was revised in Fall 08.	Conclusion related to Indirect assessment methods: Patient Survey needs revision. Action: Prepare revised Patient Survey for administration Spring 09. Conclusion related to O/P Graduate Questionnaire: Revision complete and ready for administration. Action: Implement in Spring 09.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
5. Practice management effectively	Demonstrate ability to develop, implement, and/or monitor policies and procedures regarding human resources, the physical environment,	<u>Course-Level Objectives (CLO's) Assessment(s)</u>	Achievement of CLO's = evidence of learning at the course level and evidence of successful movement toward PLO's achievement.	
		<u>Direct:</u> Instructor Critique and feedback on patient assessment, treatment, implementation, and follow up services provided by students under classroom supervision; Laboratory fabrication assessments; Exams and projects.	Results of Direct assessment methods: Review of course materials related to Critiques, Laboratory fabrication assessment, Exams and projects show evidence of learning as defined by course-level outcomes and movement toward PLO 1 through 4 achievement.	Conclusion of Direct assessment methods: These methods provide important, ongoing, formative information regarding CLO and PLO achievement relative to patient assessment, treatment, implementation, and follow up services. Action: Continue to collect and analyze data as described.
		<u>Indirect:</u> Patient Survey	Results of Indirect assessment method(s), Patient Survey did not provide useful responses and were not administered consistently.	Conclusions relative to Indirect assessment method(s): Patient Survey needs revision. Action: Revise and implement in Spring 09.
		<u>Direct:</u> HEA 335 CLO's and assessments; Initial Patient Interview. <u>Indirect:</u> Employer Questionnaire	Results of review of Direct methods, HEA 335, course materials including syllabus, course-level outcomes and assessments and the	Conclusion of Direct and Indirect assessment methods: Data collected at this time (HEA 335) do not adequately reflect

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
	business and financial practices, and organizational management.		Initial Patient Interview form shows linkage to PLO 5. Also, review of these data indicated evidence of PLO 5 achievement is not comprehensive and warranted additional data at the end of the program and post program. Employer Questionnaire (indirect) are in planning stage.	student knowledge and skills regarding PLO 5 achievement at the conclusion of the program. Action: Review and strengthen HEA335 and the Initial Patient Interview for linkage to PLO 5. Complete Employer Questionnaire for Spring 2009.
6. Promote competency and enhance professional practice	Demonstrate ability to participate in personal and professional development through continuing education, training, research, and organizational affiliations.	<u>Direct</u> : Required Online Learning Modules. <u>Indirect</u> : Employer Questionnaire	Results of examination of Direct assessment method, Learning Modules, indicate minimal evidence of PLO 6 achievement. Indirect assessment methods: Employer Questionnaire in planning stage.	Conclusion of Direct and Indirect assessment methods: Methods need revision and/or development. Action: Review and revise HSC 498 CLO's and Online Learning Module assignment to provide evidence of PLO 6 achievement. Also, include PLO 6 in Employer Questionnaire to be implemented in Spring 2009.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
7. Use lab equipment and supplies correctly, safely and efficiently	Demonstrate ability to maintain a safe and secure laboratory and clinical environment.	<u>Direct:</u> Employer Questionnaire. Practical Exams and Critique at the course level (formative) <u>Indirect:</u> none at present	Results of Direct methods, Practical Exam and Critique responses during classroom clinical supervision indicate evidence is present of PLO 7 achievement.	Conclusion of Direct methods, Practical Exams and Critique: These methods while offering formative information of PLO 7 achievement at a beginning level, do not provide end of program evidence of learning regarding PLO 7. Action: Strengthen linkage to PLO 7 and include in Employer Questionnaire
8. Ensure structural safety, comfort, fit and patient understanding about use and maintenance	Demonstrate ability to act consistently and professionally in all patient situations.	<u>Direct:</u> Clinical Preceptor Evaluation; Case Studies and Clinical Logs; <u>Indirect:</u> Patient Survey	Results of review of assessment materials related to Direct assessment methods, Clinical Preceptor Evaluation, Clinical Case Studies and Logs, show some evidence of PLO 8 achievement regarding structural safety, comfort, and fit. Evidence lacks consistency regarding patient understanding responses. Results of review of assessment materials related to Patient Survey are not useful.	Conclusion regarding Direct assessment methods: Clinical Case Study and Clinical Log assignments need to be revised to strengthen and include all aspects of PLO 8. Action: Administer revised assignments in Spring, 2009. Conclusion and Action: Include PLO 8 in revised Patient Survey to be implemented in Spr. 09

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
9. Utilize Universal precautions and personal protective equipment in compliance with OSHA's rulings	Demonstrate ability consistently in all patient situations.	<u>Direct</u> : Clinical Preceptor Evaluation; <u>Indirect</u> : Employer Questionnaire	Results of review of assessment materials, Clinical Preceptor Evaluation revealed no data regarding PLO 9.	Conclusion regarding Direct and Indirect assessment methods: Add to Clinical Preceptor Evaluation. Include in Employer Questionnaire. Action: Prepare for administration, Spring 2009.
10. Practice relationship-centered, culturally sensitive care with individuals and families.	Demonstrate ability during all phases of O&P interaction.	<u>Direct</u> : Clinical Case Studies and Logs, Clinical Preceptor Evaluation, Research paper <u>Indirect</u> : O/P Graduate Questionnaire; Employer Questionnaire	Results of examination of materials relating to Direct assessment methods revealed little to no evidence of PLO 10 achievement. Also, Indirect assessment method data are not available at this time.	Conclusion regarding Direct and Indirect assessment methods: Revision and/or development is required to include evidence of PLO 10 achievement and program quality. Action: Prepare to administer revised Clinical Case Studies and Logs, Clinical Preceptor Evaluation and Research paper assignment and completed O/P Graduate Questionnaire and Employer Questionnaire in Spring 2009.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
11. Exhibit psychosocial awareness of patients age, educational status, economic status, social support, etc.	Demonstrate ability during all phases of O&P interaction.	Same as PLO 10	Same as PLO 10 to provide evidence of PLO 11 achievement.	Same as PLO 10 to provide evidence of PLO 11 achievement and program quality.
12. Work effectively on interdisciplinary teams.	Demonstrate ability during interaction with patients, colleagues, supervisors and other health team members.	<u>Direct</u> : Clinical Preceptor Evaluation <u>Indirect</u> : O/P Graduate Questionnaire, Employer Questionnaire	Results regarding review of Direct assessment methods, Clinical Preceptor Evaluation, revealed evidence of PLO achievement. Indirect assessment methods, O/P Graduate Questionnaire and Employer Questionnaire.	Conclusion: These data provide important evidence of learning regarding PLO 12. Action: Administer these Direct and Indirect assessment methods Spring, 2009.
13.Exhibit ethical behavior in all professional activities.	Demonstrate ability during interaction with patients, peers and colleagues, teachers and supervisors, and health team members/affiliates.	<u>Direct</u> : Clinical Preceptor Evaluation, Clinical Case Studies and Clinical Logs ; and Research paper. <u>Indirect</u> : O/P Graduate Questionnaire, Employer Questionnaire.	Same as PLO 10 & 11 to provide evidence of PLO 13 achievement.	Same as PLO 10 & 11 to provide evidence of PLO 13 achievement and program quality.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
14. Provide evidence-based, clinically competent care.	Demonstrate ability to apply knowledge from theory, research, new sciences and foundation courses such as kinesiology, anatomy, biomechanics, gait, and material science to the practice of O&P.	<u>Direct</u> : Research paper, Clinical Case Studies and Clinical Logs, Clinical Preceptor Evaluation. <u>Indirect</u> : O/P Graduate Questionnaire.	Analysis of Direct assessment methods, Research paper, Clinical Case Study, Clinical Logs, Clinical Preceptor Evaluation, revealed little to no evidence of PLO 14 achievement.	Conclusion: Direct and Indirect assessment methods require inclusion of data to provide evidence of PLO 14 achievement and evidence of program quality. Action: Revise Research Paper, Clinical Case Study and Clinical Log assignments (Direct) to include evidence of PLO 14. Add to the Clinical Preceptor Evaluation (Direct)and O/P Graduate Questionnaire(Indirect) items regarding achievement of PLO 14. Administer these assessment methods Spring, 2009.

Unit of Evaluation	Criteria/Indicators	Methods	Results	Conclusions/Actions
<u>Program Quality and Effectiveness:</u> 1. Curriculum: modifications to capture professional behavior content and performance 2. Curriculum: strengthen course content and performance relative to application of theory and research. 3. Competency-based Professional Practice Model.	100% of syllabi reflect content and performance expectations throughout the curriculum. 100% of syllabi reflect content and performance expectations throughout the curriculum. Hallmarks of a competency based professional practice are readily apparent in student performance.	Syllabi review pre and post revision implementation. Syllabi review pre and post revision implementation. Critiques, Practical Examinations, Clinical Preceptor Evaluations, Patient Survey, Employer Questionnaire	Completed as of December, 2008 Completed as of December, 2008 Evidence of hallmarks is present in PLO's 1 through 6 based on 2007/2008 sampling materials	Continue review and revision as needed Continue review and revision as needed Conclusion: Insure that evidence is present in assessment of all PLOs. Action: Collect and analyze responses to 2009 assessment methods and ongoing.

“WHAT WE ASSESS” MATRIX FOR O&P

Sorted by Cognitive, Psychomotor, and Afferent Knowledge and Skills

<i>“Domains of Practice for Certified Practitioners of Orthotics and Prosthetics” (By ABC)</i>	Cognitive (Knowledge)	Psychomotor (Hand Skills)	Afferent (Professional Behavior, Ethics, Psychosocial Awareness)
Domain 1. Patient Assessment			
1. Review patient’s prescription/referral	<ul style="list-style-type: none"> - Knowledge of pathologies (i.e. muscular, neurological, skeletal, vascular) - Knowledge of basic pharmacology - Knowledge of medical terminology - Knowledge of referral documents - Knowledge of policies & procedures regarding privileged information. - Knowledge of roles & responsibilities associated with other healthcare professions 	<ul style="list-style-type: none"> - Skill in interpreting referral document, e.g. prescriptions, orders - Skill in interpreting radiological images - Skill in communicating with patient/family/caregiver - Skill in managing patients relative to their diagnosis or condition 	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information. - Knowledge of roles & responsibilities associated with other healthcare professions - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other health care providers/care givers) - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of the psychology of the disabled - Skill in communicating with patient/family/caregiver - Skill in managing patients relative to their diagnosis or condition
2. Take comprehensive patient history: demographic characteristics, family dynamics, previous use of orthosis/prosthesis, diagnosis, work history, avocational activities, signs & symptoms, medical history (allergies, current medications), reimbursement status, patient expectations, patient compliance with ancillary care, results of diagnostic evaluations.	<ul style="list-style-type: none"> - Knowledge of procedures to record data - Knowledge of policies & procedures regarding privileged information - Knowledge of reimbursement protocols (i.e. CMS, DMERC) - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other health care providers/care givers) - Knowledge of the psychology of the disabled 	<ul style="list-style-type: none"> - Skill in interpreting radiological images - Skill in communicating with patient/family/caregiver - Skill in managing patients relative to their diagnosis or condition - Skill in solving patient’s problems related to ADLs - Skill in documentation 	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information. - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of the psychology of the disabled - Skill in managing patients relative to their diagnosis or condition - Skill in communicating with patient/family/caregiver
3. Perform a diagnosis-specific functional clinical & cognitive	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver 	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information.

<p>ability exam: MMT, ROM, Sensory testing, Joint stability, Observational gait analysis, Postural evaluation, Balance evaluation, Motor control, Cognitive ability, Skin integrity, Measurements, Diagnostic imaging</p>	<ul style="list-style-type: none"> - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of pathological gait - Knowledge of tissue characteristics/management - Knowledge of volumetric control - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of basic pharmacology - Knowledge of medical terminology - Knowledge of procedures to record data - Knowledge of policies & procedures regarding privileged information. - Knowledge of universal precautions, including sterile techniques & infection control - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of clinical examination techniques (i.e. ROM, MMT, Sensation, Proprioception) - Knowledge of measurement tools & techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation outcomes) - Knowledge of human development & aging, ranging from pediatric to geriatric, as they relate to orthotic & prosthetic treatment - Knowledge of the psychology of the disabled 	<ul style="list-style-type: none"> - Skill in performing physical examinations - Skill in identifying gross surface anatomy - Skill in interpretation of physical findings (e.g. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in using mechanical measuring devices - Skill in using electronic measuring devices - Skill in using computer-based measuring devices - Skill in use of safety equipment - Skill in documentation 	<ul style="list-style-type: none"> - Knowledge of universal precautions, including sterile techniques & infection control - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility
<p>4. Consult with other health care providers & caregivers about patient's condition in order to formulate a treatment plan</p>	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training - Knowledge of pathological gait - Knowledge of tissue characteristics/management - Knowledge of volumetric control - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of basic pharmacology - Knowledge of medical terminology - Knowledge of referral documents - Knowledge of procedures to record data - Knowledge of policies & procedures regarding 	<ul style="list-style-type: none"> - Skill in communicating with referral sources & appropriately licensed healthcare providers - Skill in managing patients relative to their diagnosis or condition - Skill in solving patient's problems related to ADLs - Skill in documentation 	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information. - Knowledge of roles & responsibilities associated with other healthcare professions - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other health care providers/care givers)

	privileged information - Knowledge of roles & responsibilities associated with other healthcare professionals. - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other healthcare providers/care givers) - Knowledge of orthotic/prosthetic design - Knowledge of human development & aging, ranging from pediatric to geriatric, as they relate to orthotic & prosthetic treatment - Knowledge of the psychology of the disabled		
5. Verify patient care by documenting history, ongoing care, and follow-up, using established record-keeping techniques	- Knowledge of procedures to record data - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of basic pharmacology - Knowledge of medical terminology - Knowledge of policies & procedures regarding privileged information - Knowledge of care & maintenance of orthoses/prostheses	- Skill in managing patients relative to their diagnosis or condition - Skill in solving patient's problems related to ADLs - Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in documentation	- Knowledge of policies & procedures regarding privileged information - Skill in documentation
6. Refer patient to other healthcare providers, if appropriate, for intervention beyond orthotic/prosthetic scope of practice	- Knowledge of policies and procedures regarding privileged information - Knowledge of roles and responsibilities associated with other healthcare professions - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other health care providers/care givers)	- Skill in communicating with patient/family/caregiver - Skill in communicating with referral sources & appropriately licensed health care providers - Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in managing patients relative to their diagnosis or condition - Skill in solving patient's problems related to ADLs - Skill in documentation	- Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other health care providers/care givers) - Skill in communicating with referral sources & appropriately licensed health care providers - Skill in documentation
Domain 2. Formulation of a Treatment Plan			
1. Evaluate findings to determine an O/P treatment plan.	- Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of normal human locomotion - Knowledge of pathological gait - Knowledge of planes of motion	- Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal & pathological gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in use of materials and components	

	<ul style="list-style-type: none"> - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of referral documents - Knowledge of procedures to record data - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of clinical examination techniques (i.e. ROM, MMT, sensation, proprioception) 	<ul style="list-style-type: none"> - Skill in solving patient's problems related to ADLs - Skill in documentation 	
2. Formulate treatment goals & expected outcomes to reduce pain, increase comfort, provide stability, prevent deformity, address aesthetic factors, &/or promote healing to enhance function & independence.	<ul style="list-style-type: none"> - Knowledge of normal human locomotion - Knowledge of gait training - Knowledge of pathological gait - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of materials science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of the psychology of the disabled 	<ul style="list-style-type: none"> - Skill in communicating with the patient/family/care giver - Skill in the analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in use of materials and components - Skill in aesthetic finishing - Skill in evaluating fit and function of an orthosis/prosthesis - Skill in restoring optimal fit & function of orthoses/protheses - Skill in solving patient's problems related to ADLs - Skill in documentation 	
3. Consult with physician/referral source/appropriately licensed healthcare provider to modify, if necessary, the original prescription &/or treatment plan	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training - Knowledge of pathological gait - Knowledge of tissue characteristics/management - Knowledge of volumetric control - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of basic pharmacology - Knowledge of medical terminology - Knowledge of referral documents - Knowledge of procedures to record data - Knowledge of policies & procedures regarding privileged information - Knowledge of roles & responsibilities associated with other healthcare professionals. 	<ul style="list-style-type: none"> - Skill in interpreting referral document (e.g. prescriptions, orders) - Skill in communicating with referral sources & appropriately licensed healthcare providers - Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in use of materials and components - Skill in solving patient's problems related to ADLs - Skill in documentation 	

	<ul style="list-style-type: none"> - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other healthcare providers/care givers) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of clinical examination techniques (i.e. ROM, MMT, sensation, proprioception) - Knowledge of materials science - Knowledge of componentry - Knowledge of alignment devices & techniques - Knowledge of mechanics (i.e. levers & force systems) - Knowledge of human development & aging, ranging from pediatric to geriatric, as they relate to orthotic & prosthetic treatment - Knowledge of the psychology of the disabled 		
4. Identify design, materials and components to support treatment plan	<ul style="list-style-type: none"> - Knowledge of biomechanics - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of impression-taking techniques, materials, devices & equipment - Knowledge of materials science - Knowledge of componentry - Knowledge of alignment devices & techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of item warranty & warranty limitations 	<ul style="list-style-type: none"> - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components - Skill in use of alignment devices - Skill in aesthetic finishing - Skill in solving patient's problems related to ADLs - Skill in documentation 	
5. Develop treatment plan based on patients needs, education & follow-up	<ul style="list-style-type: none"> - Knowledge of pathologies (i.e. muscular, neurology, skeletal, vascular) - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privileged information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of boundaries of the scope of practice (i.e when to refer a patient to other healthcare providers/care givers) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic./prosthetic fitting criteria - Knowledge of care and maintenance of orthosis/prosthesis 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/care giver - Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in aesthetic finishing - Skill in maintaining & repairing orthoses/prostheses - Skill in solving patient's problems related to ADLs 	

	<ul style="list-style-type: none"> - Knowledge of human development & aging, ranging from pediatric to geriatric, as they relate to orthotic & prosthetic treatment - Knowledge of the psychology of the disabled - Knowledge of patient educational materials 	<ul style="list-style-type: none"> - Skill in documentation 	
6. Communicate with patient and caregivers treatment plan and any optional plans, including disclosure of potential risks/benefits in orthotic or prosthetic care.	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information - Knowledge of roles & responsibilities associated with other healthcare professions - Knowledge of reimbursement protocols (i.e. CMS, DMERC) - Knowledge of material safety procedures & standards (i.e. OSHA, MSDS) - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of scope of practice (i.e. when to refer a patient to other healthcare providers/care givers) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of human development & aging, ranging from pediatric to geriatric, as they relate to orthotic & prosthetic treatment. - Knowledge of the psychology of the disabled - Knowledge of patient education materials 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in communicating with referral sources & appropriately licensed health care providers - Skill in managing patients relative to their diagnosis or condition - Skill in solving patient's problems related to ADLs - Skill in documentation 	
7. Document treatment plan	<ul style="list-style-type: none"> - Knowledge of procedures to record data - Knowledge of policies & procedures regarding privileged information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) 	<ul style="list-style-type: none"> - Skill in managing patients relative to their diagnosis or condition - Skill in documentation 	
8. Inform responsible parties of financial responsibilities (i.e. insurance verification/authorization, deductibles, co-pays) as they pertain to proposed treatment plan.	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information - Knowledge of reimbursement protocols (i.e. CMS, DMERC) - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/care giver - Skill in managing patients relative to their diagnosis or condition - Skill in documentation 	

	Cognitive (Knowledge)	Psychomotor (Hand Skills)	Afferent (Professional Behavior, Ethics, Psychological awareness)
Domain 3. Implementation of a Treatment Plan			
1. Inform patient of possible risks & time involved in O/P procedure	<ul style="list-style-type: none"> - Knowledge of policies & procedures regarding privileged information - Knowledge of material safety procedures & standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of item warranty & warranty limitations 	<ul style="list-style-type: none"> - Skill in interpreting referral documents, (i.e. prescriptions, orders) - Skill in communicating with patient/family/caregiver - Skill in managing patients relative to their diagnosis or condition - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components - Skill in solving patient's problems related to ADLs - Skill in documentation 	
2. Provide patient with preparatory care (i.e. diagnostic splint, compression garment)	<ul style="list-style-type: none"> - Knowledge of tissue characteristics/management - Knowledge of volumetric control - Knowledge of pathologies (i.e. muscular, neurology, skeletal, vascular) - Knowledge of procedures to record data - Knowledge of policies & procedures regarding privileged information - Knowledge of universal precautions, including sterile techniques & infection control - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of orthotic/prosthetic design - Knowledge of measurement tools & techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of componentry - Knowledge of the psychology of the disabled - Knowledge of patient educational materials 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/care giver - Skill in managing patients relative to their diagnosis or condition - Skill in impression-taking/measuring for orthoses/protheses - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of materials & components - Skill in use of safety equipment - Skill in solving patient's problems related to ADLs - Skill in documentation 	
3. Select appropriate materials/techniques to obtain patient model/image	<ul style="list-style-type: none"> - Knowledge of tissue characteristics /management - Knowledge of volume control - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of procedures to record data - Knowledge of policies & procedures regarding privileged information - Knowledge of universal precautions, including sterile techniques and infection control 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/ care giver - Skill in managing patients relative to their diagnosis or condition - Skill in impression-taking/measuring for orthoses/protheses - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices 	

	<ul style="list-style-type: none"> - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of orthotic/prosthetic design - Knowledge of impression-taking techniques, materials, devices & equipment - Knowledge of measurement tools and techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of computer-aided design and manufacturing (CAD/CAM) 	<ul style="list-style-type: none"> - Skill in patient delineation rectification and/or patient model modification - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components - Skill in solving patient's problems related to ADLs - Skill in documentation 	
4. Prepare patient for procedure to initiate treatment (i.e. measure, take impression, delineate, scan, digitize)	<ul style="list-style-type: none"> - Knowledge of anatomical landmarks (surface anatomy) - Knowledge of tissue characteristics /management - Knowledge of volume control - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of policies & procedures regarding privileged information - Knowledge of universal precautions, including sterile techniques and infection control - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of impression-taking techniques, materials, devices & equipment - Knowledge of measurement tools and techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of computer-aided design and manufacturing (CAD/CAM) 	<ul style="list-style-type: none"> - Skill in identifying gross surface anatomy - Skill in managing patients relative to their diagnosis or condition - Skill in impression-taking/measuring for orthoses/protheses - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in patient delineation rectification and/or patient model modification - Skill in use of safety equipment 	
5. Perform procedure (i.e. measure, take impression, delineate, scan, digitize)	<ul style="list-style-type: none"> - Knowledge of anatomical landmarks (surface anatomy) - Knowledge of tissue characteristics /management - Knowledge of volume control - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of policies & procedures regarding privileged information - Knowledge of universal precautions, including sterile techniques and infection control - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of impression-taking techniques, materials, devices & equipment - Knowledge of measurement tools and techniques - Knowledge of orthotic/prosthetic forms (i.e. 	<ul style="list-style-type: none"> - Skill in identifying gross surface anatomy - Skill in managing patients relative to their diagnosis or condition - Skill in impression-taking/measuring for orthoses/protheses - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment 	

	assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of computer-aided design and manufacturing (CAD/CAM)		
6. Refer to manufacturer's & other technical specifications regarding materials/components	- Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of material science - Knowledge of componentry - Knowledge of item warranty and warranty limitations	- Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components - Skill in use of alignment devices - Skill in solving patient's problems related to ADLs	
7. Select appropriate materials for optimum strength, durability, & function (i.e. ankle or knee joints, feet, knee units, lamination lay ups)	- Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic criteria - Knowledge of material science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of item warranty and warranty limitations	- Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components - Skill in use of alignment devices - Skill in solving patient's problems related to ADLs - Skill in documentation	
8. Prepare delineation/impression/template for modification/fabrication (i.e. prepare impression/reverse delineation, digitize)	- Knowledge of impression-taking techniques, materials, devices and equipment - Knowledge of measurement tools and techniques - Knowledge of alignment devices and techniques - Knowledge of computer-aided design and manufacturing (CAD/CAM) - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS)	- Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in patient delineation rectification and/or patient model modification - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment	
9. Rectify and prepare patient model/image for fabrication.	- Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of anatomical landmarks (surface anatomy) - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of impression-taking techniques, materials, devices and equipment - Knowledge of rectification/modification procedures as they relate to specific orthotic/prosthetic designs - Knowledge of measurement tools and techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of material science - Knowledge of computer-aided design and manufacturing (CAD/CAM)	- Skill in identifying gross surface anatomy - Skill in impression-taking/measuring for orthoses/protheses - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in patient delineation rectification and/or patient model modification - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components	

10. Fabricate/assemble device in order to prepare for initial fitting and/or delivery	<ul style="list-style-type: none"> - Knowledge of normal human locomotion - Knowledge of pathological gait - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of measurement tools and techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of material science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of computer-aided design and manufacturing (CAD/CAM) 	<ul style="list-style-type: none"> - Skill in analysis of normal and pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in using hand & power tools - Skill in use of materials and components - Skill in use of alignment devices - Skill in evaluating fit and function of an orthosis/prosthesis 	
11. Assess device for structural safety and ensure that manufacturers guidelines have been followed prior to patient fitting/delivery (i.e. torque values, patient weight limits)	<ul style="list-style-type: none"> - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of material science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of maintenance of orthoses/protheses - Knowledge of computer-aided design and manufacturing (CAD/CAM) - Knowledge of item warranty and warranty limitations 	<ul style="list-style-type: none"> - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in using hand & power tools - Skill in use of materials and components - Skill in use of alignment devices 	
12. Assess/align device for accuracy in sagittal, coronal and transverse planes in order to provide maximum function/comfort	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb, spinal - Knowledge of anatomical landmarks (surface anatomy) - Knowledge of kinesiology, including upper limb, lower limb, spinal - Knowledge of normal human locomotion - Knowledge of gait training - Knowledge of pathological gait - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of measurement tools & techniques 	<ul style="list-style-type: none"> - Skill in identifying gross surface anatomy - Skill in analysis of normal and pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in patient delineation rectification and/or patient model modification - Skill in orthotic/prosthetic fabrication - Skill in using hand & power tools - Skill in use of materials and components - Skill in use of alignment devices - Skill in evaluating fit and function of an 	

	<ul style="list-style-type: none"> - Knowledge of material science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of the psychology of the disabled 	<p>orthosis/prosthesis</p> <ul style="list-style-type: none"> - Skill in solving patient's problems related to ADLs 	
13. Ensure that materials, design and components are provided as specified in the treatment plan	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb, spinal - Knowledge of neuroanatomy and neurophysiology - Knowledge of anatomical landmarks (surface anatomy) - Knowledge of kinesiology, including upper limb, lower limb, spinal - Knowledge of normal human locomotion - Knowledge of gait training - Knowledge of pathological gait - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of referral documents - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privileged information - Knowledge of orthotic/prosthetic design - Knowledge of orthotic/prosthetic fitting criteria - Knowledge of clinical examination techniques (i.e. Range of motion (ROM), manual muscle tests (MMT), sensation, proprioception) - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of measurement tools & techniques - Knowledge of material science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of computer-aided design and manufacturing (CAD/CAM) - Knowledge of item warranty and warranty limitations - Knowledge of the psychology of the disabled 	<ul style="list-style-type: none"> - Skill in interpreting referral documents (i.e. prescriptions, orders) - Skill in interpreting radiological images - Skill in analysis of normal and pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis of condition - Skill in orthotic/prosthetic fabrication - Skill in use of materials and components - Skill in use of alignment devices - Skill in evaluating fit and function of orthosis/prosthesis - Skill in solving patient's problems related to ADLs - Skill in documentation 	
14. Complete fabrication process after achieving optimal fit and function of orthosis/prosthesis (i.e. convert test socket to definitive orthosis/prosthesis)	<ul style="list-style-type: none"> - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of measurement tools and techniques - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of material science 	<ul style="list-style-type: none"> - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in using hand and power tools - Skill in use of materials and components 	

	<ul style="list-style-type: none"> - Knowledge of componentry - Knowledge of alignment device and techniques - Knowledge of hand and power tools - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of computer-aided design and manufacturing (CAD/CAM) - Knowledge of item warranty and warranty limitations 	<ul style="list-style-type: none"> - Skill in use of alignment devices - Skill in aesthetic finishing - Skill in solving patient's problems related to ADLs 	
15. Educate patient and/or caregiver about use and maintenance of the orthosis/prosthesis (i.e. wearing schedules or other instructions)	<ul style="list-style-type: none"> - Knowledge of anatomical landmarks (surface anatomy) - Knowledge of gait training - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of medical terminology - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privilege information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of care and maintenance of orthosis/prosthesis - Knowledge of item warranty and warranty limitations - Knowledge of human development and aging, ranging from pediatric to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled - Knowledge of patient educational materials 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in identifying gross surface anatomy - Skill in interpretation of physical findings (e.g. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in use of safety equipment - Skill in use of materials and components - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in solving patient's problems related to ADLs - Skill in documentation 	
16. Re-assess device for structural safety prior to patient delivery	<ul style="list-style-type: none"> - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of procedures to record data - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of materials science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e levers and force systems) - Knowledge of maintenance of orthoses/protheses - Knowledge of computer-aided design and manufacturing (CAD/CAM) - Knowledge of item warranty and warranty limitations 	<ul style="list-style-type: none"> - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in using hand and power tools - Skill in use of materials and components - Skill in use of alignment devices - Skill in documentation 	
17. Document treatment using established record-keeping techniques to verify implementation of treatment	<ul style="list-style-type: none"> - Knowledge of medical terminology - Knowledge of referral documents - Knowledge of procedures to record data - Knowledge of policies and procedures regarding 	<ul style="list-style-type: none"> - Skill in documentation 	

plan	privileged information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Profession Responsibility - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes)		
18. Refer patient to necessary healthcare providers (i.e. therapists) for necessary ancillary care.	- Knowledge of gait training - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of medical terminology - Knowledge of referral documents - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privileged information - Knowledge of roles and responsibilities associated with other healthcare professions - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of boundaries of the scope of practice (i.e. when to refer a patient to other healthcare providers/care givers) - Knowledge of human development and aging, ranging from pediatric to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled	- Skill in interpreting referral documents (i.e. prescriptions, orders) - Skill in communicating with patient/family/care giver - Skill in communicating with referral sources and appropriately licensed healthcare providers - Skill in managing patients relative to their diagnosis or condition - Skill in solving patient's problems related to ADLs - Skill in documentation	

	Cognitive (Knowledge)	Psychomotor (Hand Skills)	Afferent (Professional Behavior, Ethics, Psychological awareness)
Domain 4. Follow-up Treatment Plan			
1. Obtain feedback from patient an/or caregiver to evaluate outcome (i.e. wear schedule/tolerance, comfort, perceived benefits, perceived detriment, ability to don and doff, proper usage and function, overall patient satisfaction)	- Knowledge of normal human locomotion - Knowledge of gait training - Knowledge of pathological gait - Knowledge of tissue characteristics/management - Knowledge of volumetric control - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privileged information - Knowledge of universal precautions, including	- Skill in communicating with patient/family/caregiver - Skill in communicating with referral sources and appropriately licensed health care providers - Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in managing patients relative to their diagnosis or condition - Skill in aesthetic finishing - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in maintaining & repairing	

	sterile techniques and infection control - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of mechanics (i.e. levers and force systems) - Knowledge of care and maintenance of orthoses/prostheses - Knowledge of item warranty and warranty limitations - Knowledge of human development and aging, ranging from pediatrics to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled Knowledge of patient education materials	<i>orthoses/prostheses</i> - Skill in restoring optimal fit & function of orthoses/prostheses - Skill in solving patient's problems related to ADLs - Skill in documentation	
2. Assess patient's function and note any changes	- Knowledge of musculoskeletal anatomy, including upper limb, lower limb, spinal - Knowledge of normal human locomotion - Knowledge of pathological gait - Knowledge of tissue characteristics/management - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of procedures to record data - Knowledge of policies and procedure regarding privileged information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of universal precautions, including sterile techniques and infection control - Knowledge of clinical examination techniques (i.e. range of motion (ROM), manual muscle tests (MMT), sensation, proprioception) - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of human development and aging, ranging from pediatric to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled	- Skill in communicating with patient/family/caregiver - Skill in performing physical examinations - Skill in interpretation of physical findings (i.e. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal and pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in use of safety equipment - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in solving patient's problems related to ADLs - Skill in documentation	
3. Assess patient's skin condition.	- Knowledge of tissue characteristics/management - Knowledge of pathologies (i.e. muscular, neurologic, skeletal, vascular) - Knowledge of procedures to record data - Knowledge of policies and procedure regarding	- Skill in communicating with patient/family/caregiver - Skill in performing physical examinations - Skill in identifying gross surface anatomy - Skill in interpretation of physical findings (e.g.	

	<p>privileged information</p> <ul style="list-style-type: none"> - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of universal precautions, including sterile techniques and infection control - Knowledge of clinical examination techniques (i.e. range of motion (ROM), manual muscle tests (MMT), sensation, proprioception) - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of human development and aging, ranging from pediatric to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled 	<p>recognizing skin pressures, dermatological conditions)</p> <ul style="list-style-type: none"> - Skill in managing patients relative to their diagnosis or condition - Skill in evaluating fit and function of an orthosis/prosthesis - Skill in documentation 	
4. Assess patient's general health, height, and weight and note any changes	<ul style="list-style-type: none"> - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privileged information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) - Knowledge of human development and aging, ranging from pediatric to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in managing patients relative to their diagnosis or condition - Skill in documentation 	
5. Assess patient's psychological status (i.e. family status, job or caregiver) and note any changes	<ul style="list-style-type: none"> - Knowledge of procedures to record data - Knowledge of policies and procedures regarding privileged information - Knowledge of ethical standards regarding proper patient management, including ABC Code of Professional Responsibility - Knowledge of scope of practice related to orthotic/prosthetic credentials - Knowledge of orthotic/prosthetic forms (i.e. assessment, orthometry, measurement, evaluation, outcomes) 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in managing patients relative to their diagnosis or condition - Skill in documentation 	

	<ul style="list-style-type: none"> - Knowledge of human development and aging, ranging from pediatric to geriatric, as they relate to orthotic and prosthetic treatment - Knowledge of the psychology of the disabled 		
6. Assess fit of orthosis/prosthesis with regard to strategic contact (i.e. multiple force systems, total contact) to determine need for changes relative to initial treatment goals.	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training 	<ul style="list-style-type: none"> - Skill in performing physical examinations - Skill in interpretation of physical findings (e.g. recognizing skin pressures, dermatological conditions) - Skill in managing patients relative to their diagnosis or condition - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in adjusting and modifying orthoses/prostheses - Skill in maintaining & repairing orthoses/prostheses - Skill in restoring optimal fit & function of orthoses/prostheses 	
7. Assess fit of orthosis/prosthesis with regard to anatomical relationships (i.e. trim lines, static/dynamic alignment) to determine need for changes relative to initial treatment goals.	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training 	<ul style="list-style-type: none"> - Skill in performing physical examinations - Skill in identifying gross surface anatomy - Skill in interpretation of physical findings (e.g. recognizing skin pressures, dermatological conditions) - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in adjusting and modifying orthoses/prostheses - Skill in maintaining & repairing orthoses/prostheses - Skill in restoring optimal fit & function of orthoses/prostheses - Skill in solving patient's problems related to ADLs 	
8. Assess patient's achievement of planned treatment outcomes	<ul style="list-style-type: none"> - Knowledge of neuroanatomy & neurophysiology - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training 	<ul style="list-style-type: none"> - Skill in analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in use of safety equipment - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in maintaining & repairing orthoses/prostheses - Skill in solving patient's problems related to 	

		ADLs	
9. Formulate plan to modify orthosis/prosthesis based on assessment of outcomes and inform patient and/or caregiver of plan to modify orthosis/prosthesis as necessary	<ul style="list-style-type: none"> - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in use of materials and components - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in adjusting and modifying orthoses/protheses - Skill in maintaining & repairing orthoses/protheses - Skill in restoring optimal fit & function of orthoses/protheses - Skill in solving patient's problems related to ADLs 	
10. Make or supervise modifications to orthosis/prosthesis (i.e. relieve pressure, change range of motion, change alignment, change components, add pressure-sensitive pad)	<ul style="list-style-type: none"> - Knowledge of anatomical landmarks 	<ul style="list-style-type: none"> - Skill in using mechanical measuring devices - Skill in using electronic measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in using hand & power tools - Skill in use of materials and components - Skill in adjusting and modifying orthoses/protheses - Skill in maintaining & repairing orthoses/protheses - Skill in restoring optimal fit & function of orthoses/protheses 	
11. Assess modified device for structural safety	<ul style="list-style-type: none"> - Knowledge of planes of motion - Knowledge of biomechanics - Knowledge of procedures to record data - Knowledge of material safety procedures and standards (i.e. OSHA, MSDS) - Knowledge of orthotic/prosthetic design - Knowledge of materials science - Knowledge of componentry - Knowledge of alignment devices and techniques - Knowledge of mechanics (i.e levers and force systems) - Knowledge of maintenance of orthoses/protheses - Knowledge of computer-aided design and manufacturing (CAD/CAM) - Knowledge of item warranty and warranty limitations 	<ul style="list-style-type: none"> - Skill in using mechanical measuring devices - Skill in using electrical measuring devices - Skill in using computer-based measuring devices - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in using hand and power tools - Skill in use of materials and components - Skill in use of alignment devices - Skill in documentation 	

12. Evaluate results of modifications to ox/px, including static & dynamic assessment	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training 	<ul style="list-style-type: none"> - Skill in performing physical examinations - Skill in identifying gross surface anatomy - Skill in analysis of orthotic/prosthetic gait/motion - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in adjusting and modifying orthoses/protheses - Skill in restoring optimal fit & function of orthoses/protheses - Skill in solving patient's problems related to ADLs 	
13. Reassess patient knowledge of goals & objectives to ensure proper use of ox/px relative to modifications	<ul style="list-style-type: none"> - Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion - Knowledge of gait training 	<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in interpretation of physical findings (e.g. recognizing skin pressures, dermatological conditions) - Skill in analysis of normal & pathological gait/motion - Skill in analysis of orthotic/prosthetic gait/motion - Skill in managing patients relative to their diagnosis or condition - Skill in use of safety equipment - Skill in use of materials and components - Skill in evaluating fit & function of an orthosis/prosthesis - Skill in maintaining & repairing orthoses/protheses - Skill in restoring optimal fit & function of orthoses/protheses - Skill in solving patient's problems related to ADLs 	
14. Document all findings & actions & communicate with physicians, referral sources, etc. to ensure patient status is updated		<ul style="list-style-type: none"> - Skill in communicating with referral sources & appropriately licensed healthcare providers - Skill in solving patient's problems related to ADLs - Skill in documentation 	
15. Develop long-term follow-up plan		<ul style="list-style-type: none"> - Skill in communicating with patient/family/caregiver - Skill in maintaining & repairing orthoses/protheses - Skill in solving patient's problems related to ADLs 	

		- Skill in documentation	
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	Cognitive (Knowledge)	Psychomotor (Hand Skills)	Afferent (Professional Behavior, Ethics, Psychological awareness)
Domain 5. Practice Management			
1. Plan, implement, evaluate & document policies & procedures in compliance with all applicable federal & state laws & regulations & professional & ethical guidelines		- Skill in use of safety equipment - Skill in documentation	
2. Develop & implement personnel policies & procedures		- Skill in documentation	
3. Establish procedures for patient care that comply with current medical/legal requirements		- Skill in use of safety equipment - Skill in documentation	
4. Demonstrate proper documentation of patient history & financial records using established record-taking techniques		- Skill in documentation	
5. Create a professional, cooperative working environment to improve patient care		- Skill in use of safety equipment - Skill in documentation	
Domain 6. Promotion of Competency & Enhancement of Professional Practice			
1. Participate in continuing education &/or provide such education for other healthcare providers, ox & px practitioners, assistants, technicians, office staff, etc.	- Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion	- Skill in communicating with referral sources & appropriately licensed healthcare providers - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components	
2. Participate in education of residents, students & trainees.	- Knowledge of musculoskeletal anatomy, including upper limb, lower limb & spinal - Knowledge of neuroanatomy & neurophysiology - Knowledge of anatomical landmarks	- Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components	

	<ul style="list-style-type: none"> - Knowledge of kinesiology, including upper limb, lower limb & spinal - Knowledge of normal human locomotion 		
3. Conduct or participate in product development research, clinical trials & outcome studies		<ul style="list-style-type: none"> - Skill in orthotic/prosthetic fabrication - Skill in use of safety equipment - Skill in use of materials and components 	
4. Participate in the development, implementation & monitoring of public policy regarding ox/px			
5. Participate in/with consumer organizations & nongovernmental organization in order to promote competency & enhancement of ox/px profession.			

- The following matrix is entitled “What We Assess”.
- I started with the American Board for Certification in Orthotics and Prosthetics, Inc. (ABC) “*Domains of Practice for Certified Practitioners of Orthotics and Prosthetics*”, 2000. These six domains consist of several tasks. In the first column, all the Domains and each of their sub-tasks are listed. Each task, therefore, establishes the necessary horizontal rows for our matrix.
- The next four columns are assessments of values from the National Commission of Orthotic and Prosthetic Educations (NCOPE) identified “Scope of Practice”, 2006, for the contemporary practice of ABC practitioners. These assessment values are based on cognitive, psychomotor and afferent outcomes. Within the California State University, Dominguez Hills (CSUDH) educational assessments, ‘afferent’ outcomes were sub-divided into ‘Afferent –Professional Behavior’ and ‘Values’, such as Ethics, Psychosocial Awareness and Cultural Understanding.
- ABCs practice analysis developed seventy-four knowledge and skills statements. The knowledge and skill statements describe the organized body of information and the physical or mental manipulation of information or things required to perform the tasks associated with each domain. I went through the list of 74 knowledge and skills statements and ‘plugged them into’ the appropriate box of the developing matrix.
- This entire matrix is based on the knowledge, skills, tasks and domains for the entry-level ABC certified practitioner with a Bachelor’s degree.

GOAL of developing “What We Assess” Matrix:

1. Find specific areas of weakness or inadequate coverage of curriculum in CSUDH O & P Program Certificate course work
2. Find specific areas of over focus or ‘over coverage’ of curriculum in CSUDH O & P Program Certificate course work
3. Show CSUDH O & P Program faculty the programs areas of strengths and weaknesses

- NEXT PROJECT after the completion of this “What We Assess” matrix:

- 1) Development of a matrix entitled “How We Assess” our curriculum. Using the same matrix format, going back in and ‘plugging in’ the specific assessment tool that we use at CSUDH to test the O & P student on each of these tasks. This matrix will show CSUDH faculty where and how we can improve our existing outcome assessment measures. In addition, it will hopefully guide us in the development of new outcome assessment measures.